COMMODORE

PRIZE ISSUE!

JANUARY 1986

COMPUTING INTERNATIONAL

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more important add-ons

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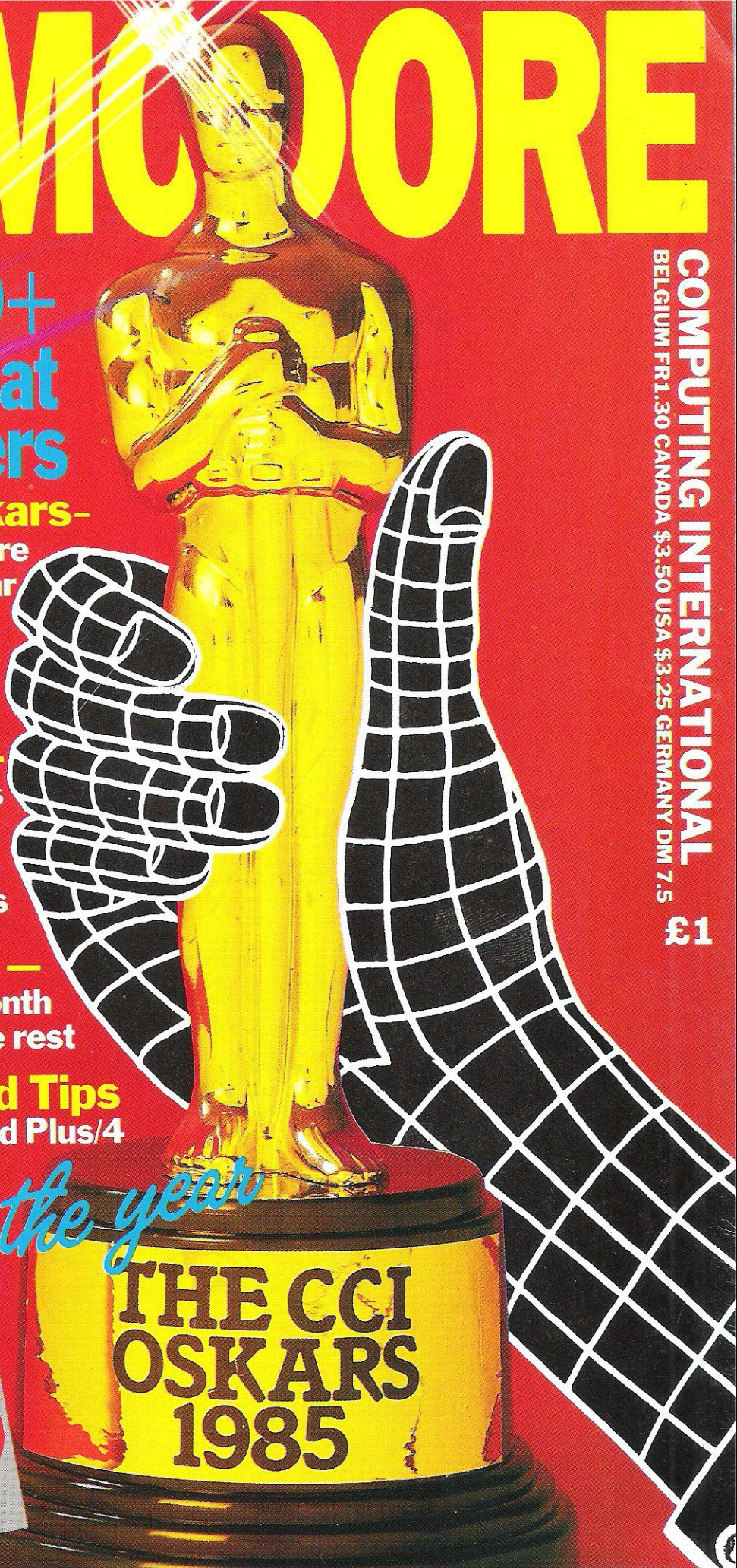
the Mega Games of the month and the best of the rest

and Interfaces and Tips
for your 64/128, C16 and Plus/4



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End of year/
January 1986

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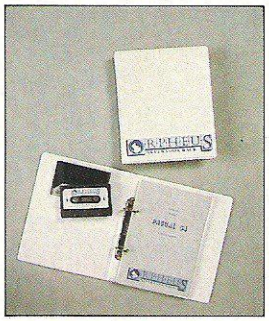
Software for your Commodore 64 *from Orpheus*



PASCAL 64

Orpheus Pascal 64 is based on standard Pascal with numerous extensions for graphics sound and hardware control. A comprehensive 128 page ring bound manual is supplied with the package which explains with examples, the working of each command. As Orpheus Pascal 64 is expected to be popular with educational and domestic users Orpheus will be providing a free technical update service to customers when they send back their user registration forms.

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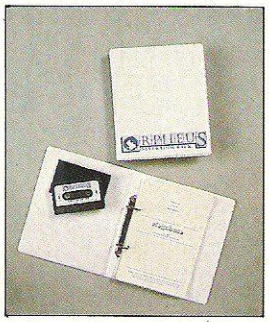

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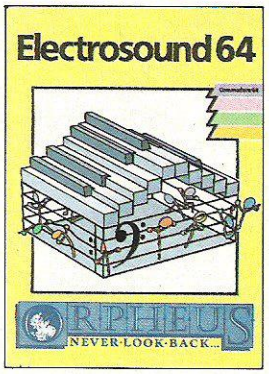

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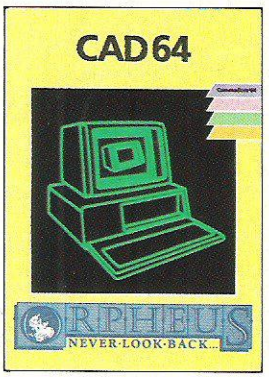

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AWARD FOR JEEVES

Jeeves (short for Joint Effort Electronic Vehicle for Epicurean Services, of course!), recently won the BP Buildarobot competition for young electronics experts.

Not only did Jeeves and his designers, from Campion School, Leamington Spa, receive critical acclaim – much more importantly they won £1000 for their school.

The challenge involved making a domestic robot, capable of performing a household chore, or other useful function.

In second place, winning £500, was a Dalek type butler with an excellent voice synth. It also cost only £200 to manufacture – surely an influencing factor.

The Duke of Kent, who gave out the prizes, commented on the amazingly high standard of these and all the other prize winners:- "I am astounded by the variety of ingenious solutions that the youngsters have come up with."

Opinion...

Dear Reader

1985 could be called the year of living more enjoyably – and more dangerously...

Awarding the CCI Oskars, though it may be difficult, made one realise how much excellent work is produced in the world of computers. Much of that seen in the Oskar winners has been a valuable building on what came before. This is not surprising for it is usually not the dramatic development, the Eureka leap, that most frequently brings the greatest enjoyment to the largest number. No, it is not the shock/astonishment/hype factor production, but almost always the imperceptible increase in practical possibility that over a period like a year – a long time in computerdom – creates the most genuine effects.

1985 has been a year for that kind of change; a year in which gradual but worthwhile progress has been made in sound – especially music – and vision, practically across the whole range of interests of Commodore owners. And Commodore's introduction of its PC's, 128 and Amiga – the Oskar-winning 'Outstanding Product of the Year' – can also be regarded as providing not a single impact but, step by step, increasing access to computer growth.

Commodore has emphasised this by its wise decision in developing the compatibility overlaps between their machines, especially the 64/128 and the PC/MS/DOS – Amiga. The general growth of compatibility itself is of fundamental importance in broadening the opportunities for computer users.

Yet these encouraging trends have been set against a background of unprecedented computer industry turbulence.

Almost without exception, the major international and UK manufacturers have racked up huge losses. Companies like Sinclair and Acorn are in genuine danger of total collapse, especially as the public is reluctant, because of their financial problems, to buy.

Some manufacturers, as is believed to be the case with Commodore, have taken this opportunity to strengthen their financial situation by writing off large amounts of dead stock as a preparation for better future results. Many software companies have disappeared completely. So while the industry had a year of turmoil, for the computer owner this has been a period for new, faster, cheaper and better facilities for using all the many dimensions of your computer; for acquiring and learning from new add-ons and – we trust, with the help of CCI – getting the very considerable best from your Commodore machine.

For the coming 1986, all of us at CCI wish you again the very best from your computer – and from all the other dimensions of your life, too.

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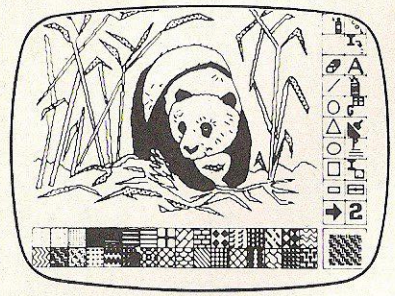
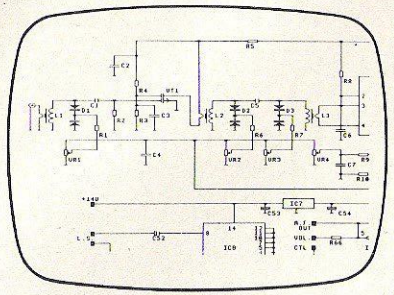
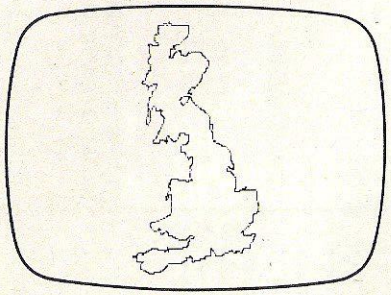


FREE-HAND DRAWING ICON SOFTWARE



ELECTRONIC CIRCUIT DESIGN WITH CIRKWIK



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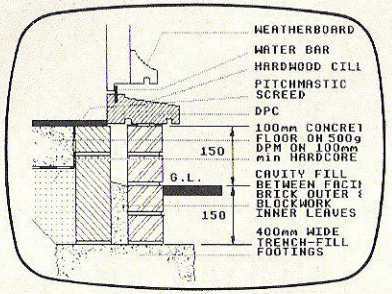

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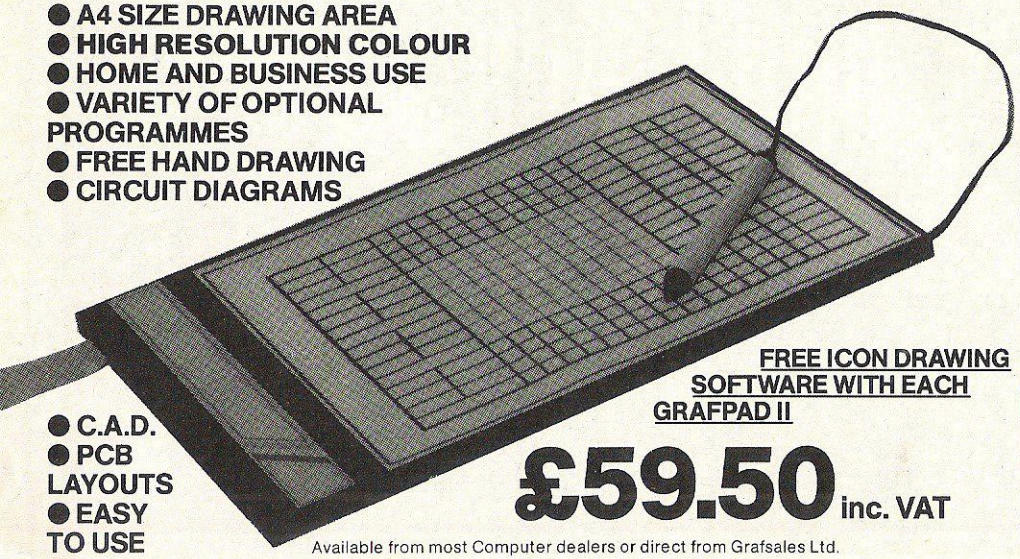

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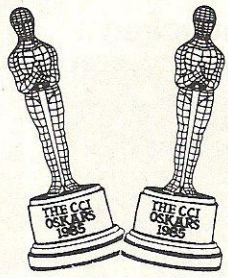
RAISE MONEY FOR CHARITY WITH CCI

Inside this issue you will see a competition which will help raise money for charity. The competition is fun, and by sending in your 50 pence entry fee, you will be contributing to a worthy cause – Soft Aid.

As well as this, CCI will be giving Great Ormond Street Childrens Hospital a Commodore 64 and data cassette, as well as 100 games to keep the children entertained during what must be a pretty lonely christmas time for some of them. Please give



generously, everything counts, and you stand a chance of winning a really mega-prize. What could be better than that?

GO ON, MAKE HIS DAY!

If you want to give your software dealer a New Year's bonus then keep an eye on his window display. The dealer who creates the most impressive display around Mirrorsoft's Strike Force Harrier and Spitfire 40, stands the chance of winning a day trip for two on Concorde to Bordeaux with £100. spending money thrown in.

So go and tell your dealer! Judging will be based on black and white photographs sent in to Mirrorsoft or Microdealer before January 31st 1986. For more details contact – Pat Bitton on 01-377 4837.

Apologies!

The gremlins are at it again! In a programming aid provided by a reader in our December issue, it read 'RAM I am told is defunct now'. Not true, of course, so many apologies to Ram.

MORE DATA PROTECTION

A reminder that from 11th November 1985, computer users who process information about individuals will have to register with the Data Protection Registrar. Those who fail to register within six months may be commiting a criminal offence, so check your computers, and comply to this useful new act.

For more details contact Nigel Waters, Assistant Data protection Registrar on (0625) 535711.

AMIGA SHOW

The Which Computer Show in January will be the first public showing of the Amiga – and that's official! At a recent conference Chris Kaday, Commodore's Sales and Marketing manager, said that although they would probably not be available until later in early '86, there will be lots to see including software as well as hardware. I look forward to it, as I'm sure everyone else does, with bated breath.

Commodore Comments...

This month's Commodore Comment comes to you from Mike Clarke , Business Systems Marketing Manager

The opinions published here are those of Commodore, and do not necessarily concur with the views of CCI.

"As you probably know, Compec, the large computer exhibition happens in the middle of November and it is in full swing as I write this. However, Commodore's involvement with Compec is quite different this year.

We have taken advantage of the fact that Compec draws in many dealers, software horses, large users and educational establishments, to introduce these people to Amiga – if they haven't already seen it – and we've done this without a stand!

Commodore has taken a secret venue close to Olympia and has invited people to catch the Amiga coaches, which are waiting adjacent to the Olympia tube station, and be whisked away to see Amiga being put through its paces.

The response is fantastic, and the list of Amiga's fans just grows and, more importantly, so does the list of people developing software and becoming associated with Amiga.

The Amiga coaches have caused quite a stir. One gentleman actually gave the coach driver an "ear-bashing" about the fact that these coaches had Amiga on the side but he couldn't buy an Amiga yet. The fact that the driver kept insisting that he only drove seemed to make no difference. Such is the interest in Amiga.

Such seems to be the interest in all Commodore products at the moment.

I think it is fair to say that it has been one of the most successful and unusual exhibitions we have ever done. What will we do at Which Computer? Why not go in January and find out?"

Mike Clarke
Business Systems
Marketing Manager

Intel launches a Superchip

Intel invented the microprocessor in 1971; they have just launched a brand new 32 bit 275,000 transistor microprocessor predicted to change the whole micro computer field. Anthony Mael gives you the picture.

When the market leader in microprocessor technology launches a product that is a leap forward, the whole industry sits up and takes notice. Intel has just made such an impact with the launch in the US of a 32 bit microprocessor – the 80386 – which will, it is predicted, offer the extra facilities for which the hesitant computer buyer has been waiting.

The surprise is not that Intel has brought this 'superchip' to the market but that it has taken so long to do it. According to the research company Dataquest, Intel had 84 per cent of the micro market in 1984 and will have taken 86 per cent in 1985. Intel largely achieved this with its universally approved 16 bit chip – the 8086; with another 16 bit – the 80286 – being chosen for an extra 7% in the IBM AT.

While other chip manufacturers like Motorola, National Semi-Conductor and AT & T have already brought out 32 bit chips. Intel points out that the 16 bit chip is still at the centre of most designers' minds for new software and that systems based on 8 bit or even 4 bit chips still continue to appear.

Will the 32 bit find as wide acceptance as the 16 bit then? Intel believes it will, and Dataquest estimates that while the 32 bit market will reach only about $17 million worldwide this year, with some 100,000 microprocessors sold, by 1990, it will be nearly $200 million and sales of 4.7 million micros.

32 vs 16 bit chip

What are the advantages of the 32 over the 16 bit chip? The 32 bit enables a micro computer to address a much larger memory and so run bigger programs, tap greater quantities of data and use mass storage devices such as optical disks.

The 32 bit (a 'bit' – a binary digit – is a fundamental data unit, a single 'on-off' action) moves and manages data 32 bits at a time instead of 16. Intel claims its 32 bit is substantially faster than the competition, for, with an operational speed of three to four MIPS (million of operations per second) it can address four gigabytes of memory, equivalent to 4 thousand million characters of text – some 6,000 times more than the current IBM PC level. When it uses virtual memory techniques (in which fixed and rotating memories are used jointly to produce, in effect, a greater capacity) this then rises to an extraordinary 64 terrabyes or 64,000 billion characters.

This huge memory capacity joined to high speed data transmission with less problem of heat dissipation – there will be 275,000 transistors on the chip with an average heat emission of only two watts – will give the Intel 80386 enough power to run at the same time large application programs written for different systems.

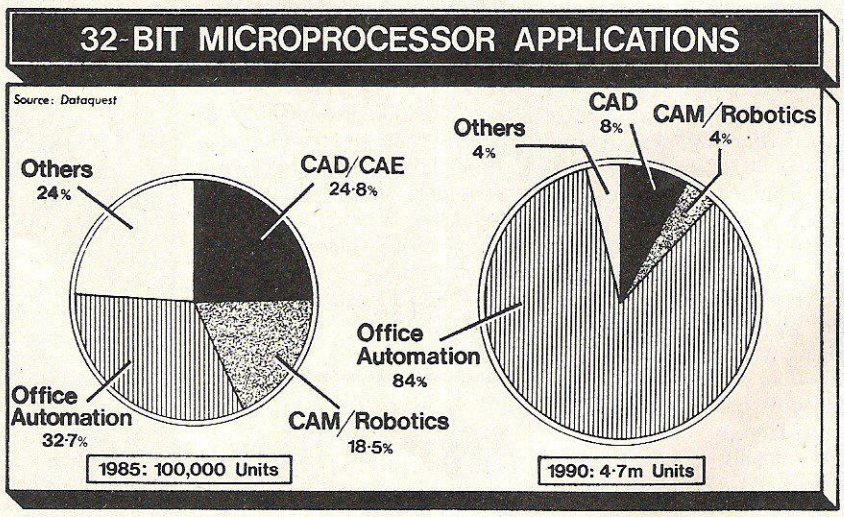
For example, in business, it permits the design of all-in-one workstations that could run complicated graphics programs for CAD, spreadsheets or other financial packages and word processing and communications like telex with 'windows' to allow access to them all concurrently. Interestingly, Dataquest says that at present office activities only take 33 per cent of the present 32 bit chip production – a percentage that should rise to 84 per cent by 1990. For more domestic use, it might be the magic chip needed for an all-in-one entertainment centre that will run games with all the complexity of the true arcade versions, and embody TV and video, compact disc and hi-fi and at the same time carry out and retain all the programs that could bring life closer to the often promised SF world.

Full compatibility with software

One very interesting feature of the 80386 is its full compatibility with all the software and much of the hardware for the existing 16 bit processor 8086 – some $6 billion worth already sold. On the new 80386, 32 & 16 bit software can be run simultaneously. In addition 'single board computers' based on the new 32 bit processor will operate over the same data highways as existing 16 bit boards. So Intel customers who supply us, the public, with computers will not have to redesign products completely. They can upgrade to provide 'next generation' models of existing products.

This will prove important for companies such as Commodore whose 16 bit state of the art Amiga, using a Motorola 16/32 bit 68000 processor, already carries some of the advanced facilities such as windows and concurrent systems. Commodore is known to be looking at the new Intel chip for other models of the Amiga family.

The present price for the new 80386 is $299 for quantities of 100, but Dataquest predicts that the price will fall by 1990 to $40.



32 bit microprocessor applications as predicted by Dataquest.

While Intel and the computer industry as a whole look hopefully to the new 80386 as a boost to the slowing growth they are suffering, for computer users it is likely to mean greater power, scope and enjoyment in computers at no higher and even possibly lower prices. So the introduction and growth of the 32 bit microprocessor could be good news all round.

THE COMMODORE 128.
HARD FACTS ABOUT THE SOFTWARE.

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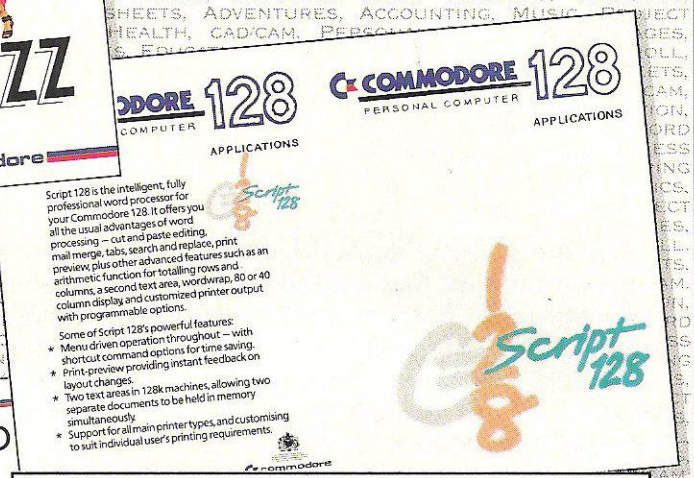
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* Two text areas in 128k machines, allowing two separate documents to be held in memory simultaneously.
* Support for all main printer types, and customising to suit individual user's printing requirements.
Script 128
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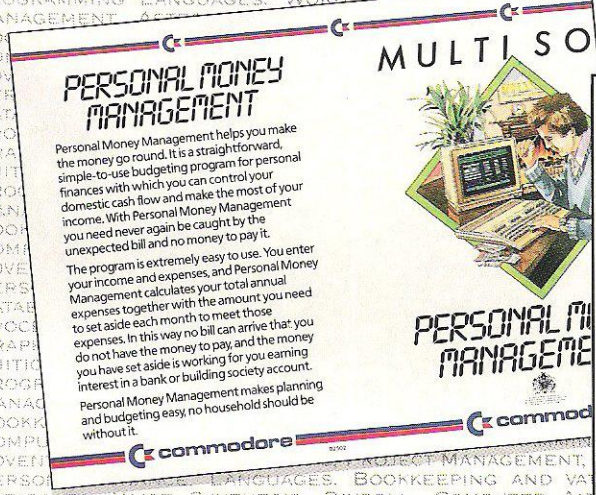
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The program is extremely easy to use. You enter your income and expenses, and Personal Money Management calculates your total annual expenses together with the amount you need to set aside each month to meet those expenses. In this way no bill can arrive that you do not have the money to pay, and the money you have set aside is working for you earning interest in a bank or building society account.
Personal Money Management makes planning and budgeting easy, no household should be without it.
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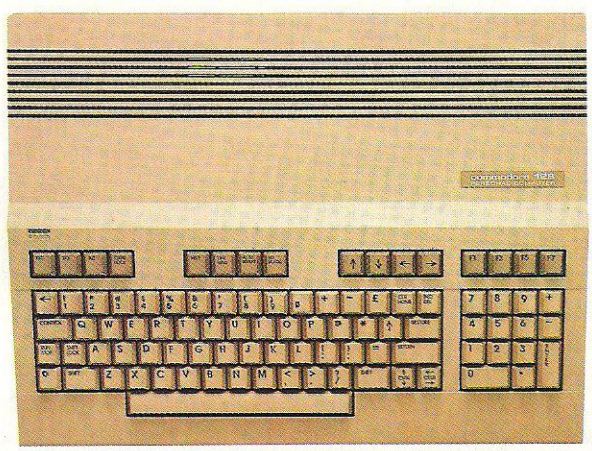

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Part II

In the highly competitive marketplace that they aim to compete in, Ocean and Imagine (for they are now one company) have spotted a route to success which was previously unexploited, and really made the most of it.

'Fame is the Name of the Game'; this article shows that as far as Ocean or Imagine are concerned, it certainly is! They have both decided that in many ways using a name of which the public are already familiar with will make selling the product an awful lot easier.

David Ward, one of the directors of Ocean and Centresoft, puts it like this:

"Licensed products are really the 'Flavour of the Month' at the moment, principally this is because, in a market crowded with releases, the chain-stores have to make a decision about which product to purchase. If you can produce a product with public cognicence, you have a head start on the rest."

With Ocean releasing Never Ending Story (see review), Rambo, Knight Rider, and others such as V, they have managed to acquire rights to many of the most publicly known figures or products of the last year.

Unlike Ocean, Imagine are concentrating on arcade clone games. Having managed a much coveted tie-up with Konami, they now have an almost certain string of top selling 64 games based on already proven arcade favourites. Hypersports was the perfect example. Converted brilliantly to the 64 it proved to be one of the biggest successes of 1985.

Imagine have put behind them the days of court cases and mass media exposure. As Colin Stokes, Sales Manager of Imagine said "No longer are Imagine going over the top. No hype, no Ferraris, just good solid products." And I must say, what I have seen of their latest products proves this point.

I'm certain that both Ocean and Imagine will have great success in 1986, and deservedly; the products they produce are excellent, and Rambo, although I have yet to see it, has a really magnificent soundtrack, courtesy of Ocean's music-man Mr Galway. David Ward sees himself as a publisher, not a programmer, and as such I think he has the right approach to making Ocean even more powerful.

FKJ

...is the name of the GAME

FRIDAY 13th

Watch out, Jason is back! If you haven't tired of the manic antics of Jason in the five (!) Friday 13th films, look out for the forthcoming release of Friday 13th, the computer game from Domark.

For those of you who have missed all five films, Jason drowned in the lake of an American holiday camp. His mother wreaked revenge on campers before being decapitated herself! (Nice eh?!) Jason then takes over the killing.

We have yet to see the game, but Domark tell us that the emphasis is placed on the element of surprise, not the bloody killings. You are a camper. Your task is to find a safe place and direct other campers to safety. Only problem is, one of them is Jason and you don't know which one.

All the characters apparently move at their own will and may or may not follow your advice. Just remember – don't hesitate or you could get an axe through the head! (I can see we are going to have to hide anything sharp when this game arrives in the office – Ed!)

NEVER ENDING STORY

Ocean's most recent release, although it was later than expected due to programming problems, is The Never Ending Story. Based on the popular 'fantasy' film of 1984-5, it has stuck quite closely to the film's storyline, and as such is exciting and enjoyable to play.

Although it is based on the 'get this', 'do that' type of game; Never Ending Story loads in four sections – the first being the base code, and the next three being the adventure. This way you get an awful lot more adventure for your money, without losing some of the excellent graphical capabilities of the 64.

The Scenario for NES places you as the hero of the film, Atreyu, who, with the help of his friends and companions must rescue the princess from the castle, where she is being held captive by the 'All Consuming Nothing' and his associate Gmork the Werewolf.

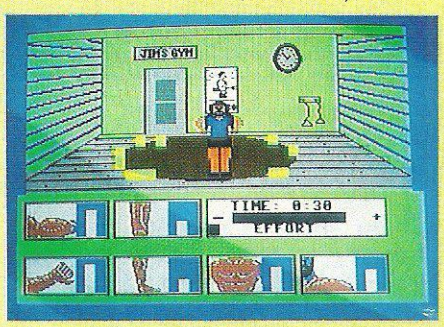
I found the game really easy to get into, and indeed I actually managed to finish the first section (with a little help from Ocean!).

GEOFF CAPES

Although not a complete preview, Martech's Geoff Capes Strong Man game, with it's claim not to be just another simulation, interested me greatly, and I just had to get it into this feature!

From what I could see of the game, success in each event depends on chasing Icons. Only the first event, the Iron Bar bend, requires the killer joystick antics. Having done this you must distribute your accumulated strength amongst your muscles (displayed on the lower half of the screen in Icons).

From then on you must chase Icons to enable Geoff to complete the various incredibly difficult events. Graphically it seems good, and the promised sound track (of which I heard tiny bursts) is by that man Rob Hubbard again, so should be absolutely fantastic! Look forward to a full review in the next issue, I certainly do!



The screen is made up of various different sections, the bottom half of the split screen is reserved for text, whilst the upper half displays a variety of pictures representing where you are, who else is there, and what you are carrying.

Being so long, and yet so easy to get involved in, NES should appeal to the hardened adventurer as well as the beginner who wants to learn, well done Ocean.

Price:	£9.95
Fast Loader	Yes
Graphics:	★★★★
Sound:	N/A
Playability:	★★★★
CCI Rating	★★★

Contact: Ocean, 6 Central Street, Manchester M2 5NS. Tel: 061-832 6633.

Fame Games cont

Zorro

Zorro, the game, arrived in the office with literally minutes to spare before we had to close this issue, so I was really lucky (well I'd much rather be home, but.....) to get a review in this feature.

Zorro was one of those immortal characters who would end one episode falling 300,000 feet onto jagged glass, and when you returned next Saturday, he would have caught a single strand of a maiden's hair, inches from his demise – and lived!

In this, their latest game, imported from Datasoft in the states, US Gold have placed you in Zorro's shoes in a complicated, if not totally original ledge game.

Although the graphics are nothing to really write home about, Zorro is neatly portrayed in cloak and mask. There is a lovely touch, in that when you kill someone with your sword, a swishing Z is carved in the air!

The tune is a little repetitive, but thankfully you can turn it off! As I didn't have long to play the game I cannot say how large the maze is, but some of the puzzles set are both challenging and clever; adding a lot to what otherwise might have been a little less interesting.

Price: £9.95
Graphics: ★★★★
Sound: ★★
Playability: ★★★
CCI Rating: ★★★
Contact: U.S. Gold, Unit 10 The Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY. Tel: 021-359 8881.

HARVEY SMITH – SHOWJUMPER.

Whether Harvey Smith is famous or infamous is an extremely arguable point. Had he not stuck two fingers at a group of press photographers, he would have been about as well known to most people as Otto Schmidt (who? Ed)!

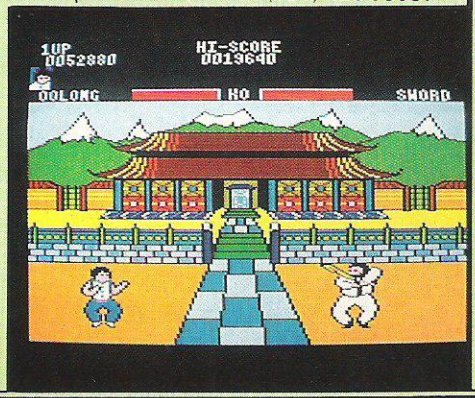
This has not stopped Software Projects from using his, and his sponsors Sanyo, name to help sell their newest game.

Having loaded, you are presented with Software Projects annoying, but essential, code. If you get past the code – one of the hardest parts of the game – you are greeted with a Mozart horn concerto. This was very nice to start with, but after not very long, it became tedious to say the least!

The game involves you having to guide your horse around various courses. As well as the predefined courses, there is a neat option for you to design your own, which does add a little to the game. **Graphically the game has some excellent touches – both horse and rider are neatly drawn – but otherwise it has little to make it stand out.**

If you are a show-jumping fanatic, I'm sure you'll find something in this game for you. Otherwise — think twice and try before you buy!

Fast Loader: Yes!
Graphics: ★★★
Sound: ★★★
Playability: ★★
CCI Rating: ★★★
Price: £7.95
Contact: Software Projects Ltd, Bearbrand Complex, Allerton Road, Woolton, Liverpool L25 7SF. Tel: (051) 428 9393.



Yie Ar Kung Fu

Having only seen the Amstrad version, this really is only a preview! The game is licensed from Konamis' highly successful arcade game, and from what I have seen it has been converted with real care, keeping all the excellent touches of the original.

You play a Kung Fu person (for lack of a better description), and you must kick, punch and jump your way through a whole host of opponents. Each of these opponents has a special forte, which will make beating him more difficult. Graphically the Amstrad version is really good, and I am promised that the 64 version will be as good, if not better.

Some of the points that make it so good are the weapons your opponents have. Throwing stars, Num-Chuckas (I'm sure it's not spelt like that!!), and fighting sticks are all included plus others.

I look forward to bringing you a proper review just as soon as I can!

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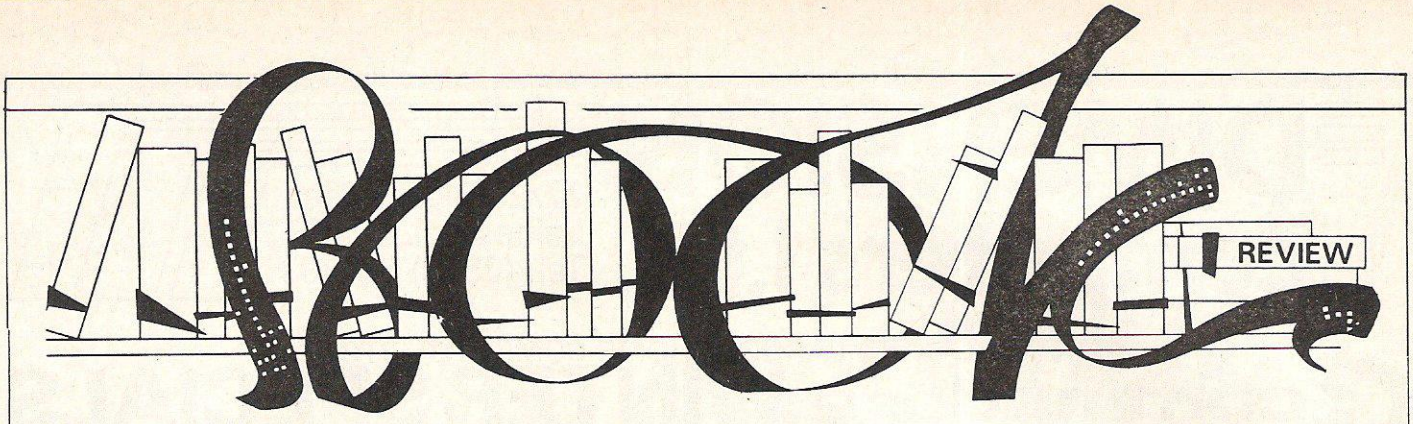

Computer journalist Peter Arnott-Job evaluates a selection of newly-released books.

PROGRAMMING THE REAL WORLD by Marcus Watney, – £9.95

Sub-titled 'How to make your programs look realistic' this book should more than satisfy anyone who has been disappointed with the way that most books – and even much commercially available software – tend to manipulate the laws of physics to suit their own ends. It may make programming easier and it may save memory but missiles simply do not fly in a straight line forever and flying an aeroplane is far more complicated than fiddling with a joystick!

This book is an explanation of how some of the laws of physics work, how they can be represented by mathematical formulae and how these formulae can be incorporated into programs. It covers ball games, flight simulation, orbits and space flight. It does the job very well. But be warned: Although the author does his best to simplify the mathematics involved it just isn't possible to simplify beyond a certain point.

Some of the maths is A-Level standard or higher and you will need a knowledge of trigonometry at least to be able to get anywhere at all. A sentence in the author's introduction sums it up. He's explaining how simple he's tried to make it and says: 'Even differential calculus is not used until the last two chapters.' I'm impressed by the author's restraint!

But the book is technical only because it has to be and the programming is, by comparison, very easy. The programming in the book relates to the Sinclair Spectrum but that shouldn't present too many problems to the keen programmer. Let's face it, if you can tackle the problems of developing mathematical equations which describe how a ball bounces, taking into account gravity, air resistance and 'bounciness' or how the wing of an aeroplane behaves, taking into account the four basic forces of weight, lift, drag and thrust, you should feel confident enough to adapt the programs for your Commodore machine!

If the idea of creating what are in effect computer models of the real world then this is an essential book for your shelves. It's interesting, well written and, although a little on the pricey side, value for money.

Contact: Century Communications, 12-13 Greek Street, London W1V 5LE. Tel: 01-434 4241.

YOUNG PROGRAMMER'S GUIDE: COMMODORE 64 by Michael Wardle and John Mills, – £5.95 hardback and £2.95 softcover.

It must be difficult to write computer books for children. You must start right from the very beginning and can't assume any prior knowledge at all on the part of your readers. You must also use simple words to explain everything – imagine trying to use words of one syllable to explain PEEK and POKE and IF ...THEN. The authors of the Young Programmer's Guide to the Commodore 64 achieve their aim very successfully.

It's aimed at primary school children: kids up to the age of about 11. It takes a step by step approach and manages to make the steps big enough to make 'playing' with the computer exciting but small enough so that the reader is not expected to make too large a jump in understanding. The introduction of POKE so early on was slightly worrying on the one hand, but interesting and understandable on the other.

Worrying because it seemed a little too early but interesting and understandable because it is used to enable the kids to play about with colours – surely something that no child would be able to resist?

This is an excellent book, recommended for parents who have children who have some reading ability and can do simple arithmetic. It will introduce them, not only to computers, but also to other related concepts.

Contact: Macmillan Children's Books, 4 Little Essex Street, London WC2R 3LF.

30 HOUR USEFUL HOME COMPUTING by Clive Prigmore – £8.95

A bit of an oddity, this one. Although it does the job it sets out to do rather well and is in all ways an admirable book I can't quite see who's going to buy it. It's intended for people who may be considering buying a computer and who want to fully understand what it's all about before they make their choice. But would they really want to sit down and follow the 30 hour 'structured course' that the book constitutes?

It's a very good course covering hardware, including all the popular machines, and software, concentrating on word processors, databases and spreadsheets. At the end of each chapter there's a chance to assess your understanding of the subject so far.

In the interests of honourable book reviewing I lent the book to a neighbour, a farmer who was interested in buying a computer for his business. He found the book useful and interesting but complained that he didn't have enough time to sit down and go through it step by step. He preferred to talk to a computer consultant who visited him on his farm, discussed his needs in detail, made his recommendations and sold him the system (a suite of farm management programs running on an Apple IIe). He certainly paid more than he would have done if he'd bought the system privately and the extra cost was much more than the £8.95 price tag of Clive Prigmore's book.

The book SHOULD be read by anyone thinking of making a serious purchase. It's just that I find it difficult to imagine anyone who's committed enough to the notion of buying a computer to lay out £8.95 spending several weeks systematically studying the subject by reading 30 Hour Useful Home Computing.

If you know anyone who is thinking of making a serious purchase you could do them a great favour by giving them this book. It's a book that was worth writing, worth publishing... and worth reading.

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THE CCI O

When Hollywood gives out its yearly Oscars, there is always a huge fuss over whether the winners should have won. This is due to the fact that personal choice is the deciding factor. Our 'Oskars' were chosen by our editorial staff, having looked at and used a huge variety of products though, of course, not all. Most people will disagree with some of our decisions, some people will disagree with all of them!

Hopefully, however, you will see these awards for what they really are – a small show of appreciation to the companies and individuals who have made this such a good year for the Commodore World.

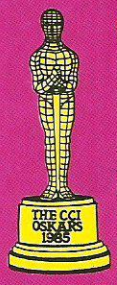
Game of
Summer

Well, well, well! What a surprise, who would
what can you criticise this game for, except
bringing out games of this quality they'll win t
And if US Gold ever stop importing Epyx ga
Suffice it to say, brilliant, absolutely brilliant!

64 Arcade game of the year..... Batalyx, by Llamasoft.

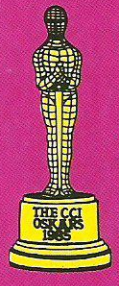
Although they have just signed a licensing agreement with Ariolasoft, Llamasoft are still one of the last family run independent concerns, and Batalyx epitomises that. It has great graphics, nice sound, enormous amounts of playability, and its simulated multi-tasking is very impressive. As well as all this you get six programs crammed into one, which means it's also outstanding value for money.

We wish Jeff Minter the best of luck with all his projects, especially on the Amiga. Keep up the good work!



64 Arcade/Adventure of the year..... Frankie Goes To Hollywood by Ocean.

Ocean had quite a few problems releasing this game on time, but when it was ready it was certainly worth the wait! FGTH is a true arcade adventure – it had murder mysteries to solve, arcade sections to complete, and some lovely colour graphics of the various rooms you explore. The soundtrack was also excellent. Let's hope Ocean maintain this high quality for years to come.



64 Adventure of the year..... Red Moon, by Level 9.

What can you say about Level 9's adventures? They are not only some of the best from England, but possibly the world. Red Moon shows their skills off very well. Neat graphics and over 200 rooms make this an interesting and very challenging game.

OSKARS

The very best of 1985

the Year
Games II

have guessed?!!! Seriously though folks,
eing uncriticisable. If Epyx continue
is award for the next 10 years, minimum!
es, they need their heads examining.

WIN £5,000!!

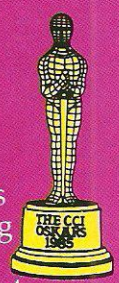
of software in our easy-to-enter Oskar competition.

See inside this issue for details.

64 Simulation of the year..... Elite, by Firebird.

Even with the flickers, Elite was innovational and excellent. Originally produced on the BBC, the conversion managed to keep most of the original's good points, and the additional memory meant more colour could be added. It could have been better, no question, but as it goes it's still No. 1 for us.

Best graphics in a game during 1985..... Summer Games II, by US Gold.



Original decision? No! But there is absolutely no way that we would have given this award to any other game! Summer Games II consists of some of the best programming we have ever seen on a home micro. Faultless movement and some wonderful touches, such as the slow motion screen make this a game of unparallelled graphical beauty (o.k-O.K!!Ed).

Game sound track of the year..... Monty On The Run, by Gremlin.

This was a pretty easy decision – although there were some excellent sound tracks this year, HyperSports and Wizardry to name but two. Gremlin Graphics in conjunction with Rob Hubbard have made a name for themselves as the best sound producers around – Monty Mole just goes to show how good the 64's sound chip really is.

THE CCI OSKARS 1985

Continued...

C16 Arcade game of the Year.... Berks, by CRL

Easily the most addictive shoot-em up game – or games – released this year for the C16. Games becauses CRL released a Berks trilogy all three games featuring impressive, colourful and even amusing graphics. Continuous fast action combined with addictiveness makes Berks a winner.

C16 Simulation of the Year... Formula 1, by Mastertronic

Undoubtedly the best simulation for the C16, both in terms of realism and excitement. High quality graphics combine with smooth scrolling for exhilerating ride! Realistic sound effects also contribute to your rising pulse rate.

Unusual entertainment of the year..... Little Computer People, by Activision.

A recent and very exciting development that proves to everyone that you can have a success on your hands purely by being very original, nothing more. Both the graphics and sound are good, but it's the lovableness of your pet, (hello Bronson!) that means this game really is great!

Bargain of the year..... The Last V8, by Mastertronic.

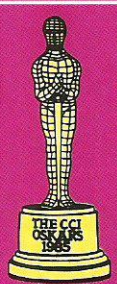
As the first of the Mastertronic Added Dimension Games, this is very impressive. Graphically it is up with almost all of the much more expensive American imports, and with a sound track done by Rob Hubbard (see Music of the year), it would be excellent at a tenner, but for £2.99 it's outstanding.

Programmer of the year..... David Crane of Activision.

"It is an honour, it's really nice when people tell me that all my time and hard work has produced a great product. And especially that they see my work as a job well done" That was David Crane's response on being told he had won this Oskar. The last two years have been great ones for David, and with the 'Little Computer People Research Team' he has created something amazingly original, we wish him all the best in 1986.

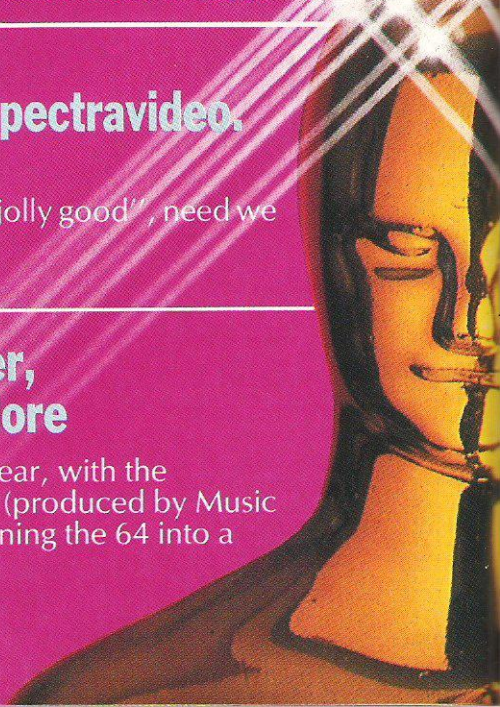
Joystick of the year..... Quickshot II, by Spectravideo.

The Quickshot II is cheap, reliable, strong, sensitive, and "really jolly good", need we say more?



Sound Peripheral of the Year... Music Maker, by Commodore

Music has been one of the most exciting developments of this year, with the emergence of some excellent add-ons. We chose Music Maker (produced by Music Sales on behalf of Commodore) for its concept of simplicity, turning the 64 into a musical instrument via software and a clip-on keyboard.



THE CCI OSKARS 1985

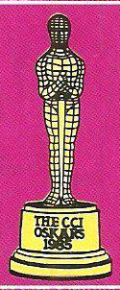
Continued...

Graphics Peripheral of the Year... Datex Mouse, by EEC

Graphics is another area which has seen a host of exciting packages. Our Oskar winner, the Datex Graphics Mouse system, is an extremely easy-to-use mouse featuring Mac-style icon-driven software. It's an ideal choice for both home and business users.

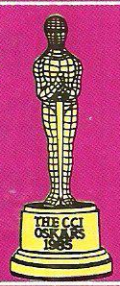
Utility of the Year... The Final Cartridge, by H & P Computers

Exceptionally good value for money, the Final Cartridge is a Dutch product with comprehensive facilities. As a fast loader it is as yet unbeaten and the sheer convenience of the total package guarantees it constant use.



Book of the Year... The Naked Computer, by Arlington Books

No-one with even the slightest interest in computers can be without it! The perfect anctedote to serious computer handbooks, the Naked Computer contains many amusing and informative insights into the extraordinary world of computers.



Educational Software of the Year... Macbeth, by Creative Sparks

Many educational programs offer no more help than a text book. Macbeth was an adventure in four parts which, together with its comprehensive background notes, taught us more about a Shakespeare play than any study aids could. Outstanding graphics added to the enjoyment and understanding of the original play.

Business Software of the Year... Superbase II, by Precision

Over 50,000 users can't be wrong! That's the ever-increasing number of Superbase users. Superbase II, released this year, offers further improvements on the excellent original. One of its best features is the ability to link with EasyScript and Easyspell providing the basis of a system usually costing £2,500+.

Printer of the Year..... CITOH/Riteman C+

Much more than just a 64 clone printer, the C+ prints at 105 characters per second, and will print all the 64's graphics, including bit-image, with ease. It can also be put into a mode where it will accept most Epson control codes making it an excellent all-round performer.

The most exciting new product announced..... THE AMIGA.

Yet another real surprise here! Probably the most impressive computer we have seen at any price, the Amiga will set standards that all others will be forced to follow. Whether it will be a success, we're not sure, but either way this machine is so far ahead of the crowd it's unbelievable.

MONTY RUNS OFF WITH THE HONOURS

Game sound track of the year...

"...This was a pretty easy decision – although there were some excellent sound tracks this year. Gremlin Graphics in conjunction with Rob Hubbard have made a name for themselves as the best sound producers around – Monty Mole just goes to show how good the 64's sound chip really is."

Commodore Computing International

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Electronic Music Now! -Computer Showcase

Musicians' imagination haven't expanded as quickly as the range of hardware, report Morris Gould.

On a cold October night six hundred pairs of ears underwent a trial by ordeal at the Bloomsbury Theatre. The event, called 'Electronic Music Now!' aimed to showcase the very latest and best in Computer Music. What it did show was that musicians' imaginations haven't expanded as rapidly as the vast range of hardware available to them.

The first piece, 'The Four Loom Weaver' by Nigel Osborne, used digital Fairlight samples of massed machinery to create an oppressive vision of those dark satanic mills. Superimposed on this, the outstanding singer Linda Hirst sprayed bursts of disjointed gutturals which slowly and sinisterly evolved into the broad dialect of an ancient Lancashire mill song. A fascinating idea – but ultimately one best left on paper!

Indeed, the problem with at least four of the five works on display was that more intellectual stimulation could have been derived from reading the excellent programme notes than sitting in a cramped theatre listening to half an hour of tape.

Doodling aimlessly

This piece, and the next three, used computers at every stage in their construction, but the final products were essentially tape compositions which could have been painstakingly produced on analogue devices such as tape recorders, in the manner of Musique Concrete. The most inspired of this early but pioneering school used primitive tape recorders to their ultimate limits, producing music in which the characteristics of the tape medium led directly to the sound perceived. Until composers learn to confront the limitations of their computers, they are condemned to doodle aimlessly like forgotten Sputniks.

In the early days of a new technology, the only people with access to the goodies are those involved in their development – this seems as sensible as restricting the playing of pianos to carpenters, or the writing of books to typesetters.

The second group privileged to play with the new toys are those able to afford them. Computer Music making can be one of the world's most expensive hobbies. Fortunately, one of the many things money still can't buy is talent, as proven by the current slough of mainstream pop music, high on MIDI cables but low on form or content. Perhaps we must wait for the machines to fall into the hands of hungry teenagers before we hear the sound of musicians using computers, and not the other way around.

After tape pieces by Smalley, Vaggione and Risset, the amiable bulk of Tim Souster sauntered onto the stage. This man has progressed over the last decade from assisting Karlheinz Stockhausen to creating experimental works which I guarantee you will have heard, even those of you who don't know their brass from their oboe. His best known works are advertising jingles for products as diverse as blancmange, Milton Keynes, and particularly Jojoba nut shampoo.

The evening's piece, laconically called 'WORK', featured an Acorn Music 500 synthesizer running on a BBC-B-microcomputer, engaged in a duel to the death with a real live pianist. Characteristically, the BBC was the only computer to be seen on stage this evening, all the others being located in remote research facilities around the world. The composer himself took to the piano stool, due to the billed pianist thoughtlessly breaking his wrist!

Computer VS pianist

First, the performer played some thundering chords on the piano, punctuated with sudden eccentric gallops up the keyboard. Next, he ran the computer program, hitting the 'Return' key with a confident flourish. In accordance with Sods law, nothing happened – so the unabashed composer grinned sheepishly at the audience and started again. This time he was rewarded by the computer playing a thin but passable imitation of the piano piece, giving him time to sit at a small table and drink a cup of coffee.

Then man and machine launched into an almighty battle, each mimicking the notes played by the other. Neither side seems likely to concede defeat, so eventually the game finished with a final score of 1-1, and both teams got a standing ovation.

'WORK' seems to have been enjoyed by all sections of the audience, from avant-garde buffs to a boisterous party of schoolkids. Interestingly, the piece was commissioned by Acorn computers. The actual sounds made by the Acorn synthesizer package weren't very exciting or original – you could get the same results from your SID chip. But the event functioned less as a demonstration of the machine than an indication of the resourcefulness of Acorn's promotion department.

Of course, computer companies aren't known for their altruism. They have to establish their machines in the vital musical market by involving musicians of all sorts in their promotional campaigns. But at present, Commodore seem quite happy to simply push their musical add-ons at micro buffs. This could prove a costly mistake.

Computers as musical tools

The C64 is the cheapest route to the digital processing that dominates today's music of all kinds. With interfacing, the humble C64 can be used as a synthesizer, a digital sampler, or a powerful sequencer – it can even drive an automated mixing desk. If a series of cheap, friendly and well-supported interfaces were available, thousands of new customers would buy computers exclusively for use as musical tools. After all, the cost of a budget computer/synth package is comparable to that of a drum kit or an up-market guitar – and the possibilities are infinitely wider.

If the new Music Sales range proves to be the first step on that ladder, it could initiate a revolutionary change in the balance of power of popular music, in which Britain would lead the way. After all we are the most computer literate and pop-fixated nation on earth. The best way to bring that about would be for hardware and software manufacturers to work together with the new breed of musical pioneers who will shape the sounds of tomorrow.

Musical Marvels

With the C64 now consolidating its position as the number one micro for musicians, the trickle of musical hardware and software is turning into a deluge. There are budget systems using the internal SID chip, and more up-market ones which bypass it altogether, like the ingenious Siel 'Sound Buggy' (see December's CCI). Now the much vaunted 'Advanced Music System' straddles the gulf between the toy programs and the professional market by giving the state of the art in SID chip soundmaking, while opening the door to the wonderful and frightening world of MIDI compatibility.

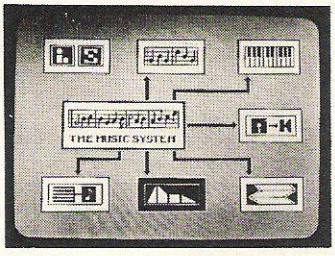
The history of A.M.S. goes back to a BBC-B envelope shaper first marketed in 1983. It evolved through the hard work of programmers and musicians into the complete BBC Music System, and was recently transplanted onto the C64 with the addition of many new features. It's obvious that a lot of time, effort and money has gone into A.M.S. – anybody writing a competing system might as well stop right now, because this one will be hard to beat!

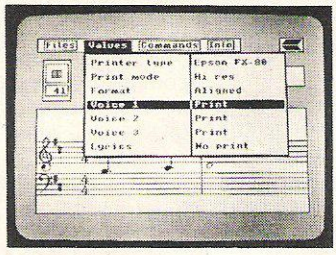
"Best manual I've seen for a long time"

Along with the disk, there is an authoritative manual which is the best I've seen for a long time. There are 94 pages including six pages of index, and if I tell you that the whole book is very concise and clear you'll realise that there are a lot of functions to be described!

The Advanced Music System is protected by a new device called Lenslok. This is a plastic lens which is placed on the monitor screen and used to decipher a randomly-generated password. Anti-piracy measures were used instead of normal anti-copying ones, which means that the master disk can be freely backed up, but cannot be used without the right lens. If you have a small monitor, this is a minor inconvenience – but using a full-sized TV it took me eight hours to get into the program, because of the larger pixel size!

The title screen, if you ever reach it, sets the tone of the whole system, with superb animated icons providing a choice of six modules. The





graphics throughout are exemplary, and all functions are accessed by pairs of keys according to an integrated plan. The space bar advances the icons in turn until the desired module is highlighted.

"The heart of the system"

The first module is the EDITOR, which is really the heart of the system. As in all six sub-programs, a command line at the top of the screen offers file utilities, lists of values to change and commands to implement, and a helpful Info page, which reminds you what you're doing. Using a function key brings the appropriate pop-up menu onto the screen as an overlay, and after a while you can learn to access these areas with dazzling speed.

Notes are entered onto treble + bass staves after the correct pitch and length has been selected. Triplets, dotted notes, rests and tied notes are included, as are sharps, flats, naturals and even the elusive double accidental. You can tell that musicians have been involved in the specification and development of this system from the beginning, because all these functions are done in the way a musician would find most useful, instead of the way a programmer would find easiest to write.

"Goodies far too numerous to mention"

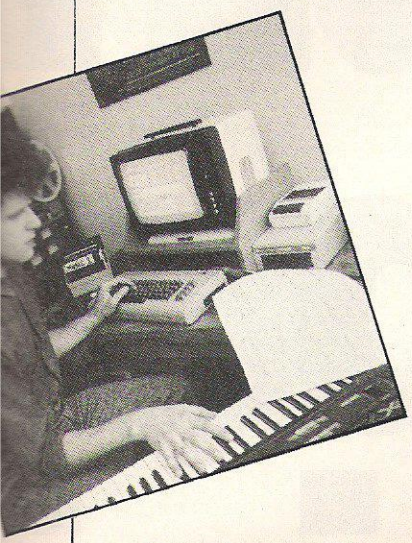
Barlines are central to the whole system, because they are used to line up the different voices. There are a staggering seven different types, which can be entered manually or automatically, allowing complex verse/chorus structures in each channel. There are block markers, a useful scratchpad and other goodies far too numerous to mention.

The KEYBOARD module provides a method of entering notes in real time, using the QWERTY keys or an overlay keyboard, although the latter does cover some essential letters, which is irritating. (The manual recommends using lumps of Blu-tak under the keys, if you like that sort of thing.)

An icon shows cassette recorder symbols (play, record, pause, rewind etc.), and tunes can be quickly entered here, and later tidied using the Editor. A rather quiet metronome is provided, but of course this does use one of the SID oscillators.

"Squeeze every possible noise out of SID"

The SYNTHESIZER module is used to create sounds by varying the waveform and ADSR shape. The data for each preset is called an envelope, and these are stored in sets of 15 on disk, together with an optional filter. The static parameters are supplemented by Dynamic Response Envelopes, which allow pitch or filter cut-off point to be modulated by another waveform during the duration of the note. This module can get very intimidating, especially with all the pull-down graphs plastered everywhere, but it does allow every possible noise to be squeezed out of poor old SID.



Next is the LINKER which chains sequences together to make complete songs lasting up to five hours, and PRINTER which prints sheet music onto a variety of printers, albeit very slowly. This latter has a text editor to allow lyrics to be stored and printed along with the music.

Last but not least is the MIDI module, which allows AMS music files to be converted into MIDI format and vice versa. SIEL and PASSPORT interfaces are supported, although we used a JMS and this seemed to work perfectly well. Six tracks can be stored, a clever Envelope Assignment icon maps MIDI patches onto envelope numbers.

"Good value for money"

At a RRP of £39.95, this package does offer good value, especially compared to early MIDI software. The clever bit is that for half this price you can start with 'The Music System' on cassette, which contains the SYNTH module and a combined EDITOR/KEYBOARD. All the music files produced are compatible with AMS, and an upgrade is available for the price difference – to whet your appetite for the more sophisticated system, both manuals are included, which is an excellent piece of marketing!

As you might have guessed, I like this package a lot. It has lots of features which I can wholeheartedly recommend. However, before buying any software, think carefully whether it's right for you. If you want to use your C64 for live work, this won't be much use to you. Equally, if you are a reasonably competent pianist, the combination of the overlay keyboard, its restricted range and the sheer one-fingeredness of the whole system will drive you to distraction very quickly. It's a shame that the designers, haven't allowed all three voices to be displayed on the same staves, which would make it possible to write three-voiced piano music. But if you are not a very technical pianist, these limitations won't worry you very much.

Equally, even at their best the SID sounds are very thin and weedy. But they're perfectly good enough for writing music with, and a good usage of AMS would be for hard-headed, money-conscious songwriters. They could compose songs at home, and then go into a studio and dump all the music onto a DX-7, or even a MIDI drum machine, in a very short time, without having to own a MIDI keyboard at all. If you're thinking of doing demos, the package could pay for itself in a few hours by saving studio time. And if you're ambitious but short of cash, you can start with A.M.S. now, and find out cheaply whether step-time sequencing is the way for you.

Contact: Rainbird, 6/9 Upper St Martins Lane, London WC2. Tel: 01-379 6755.

Morris Gould

A NEW MUSICAL EXPERIENCE

Sound Buggy

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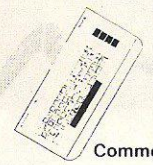
Commodore 64

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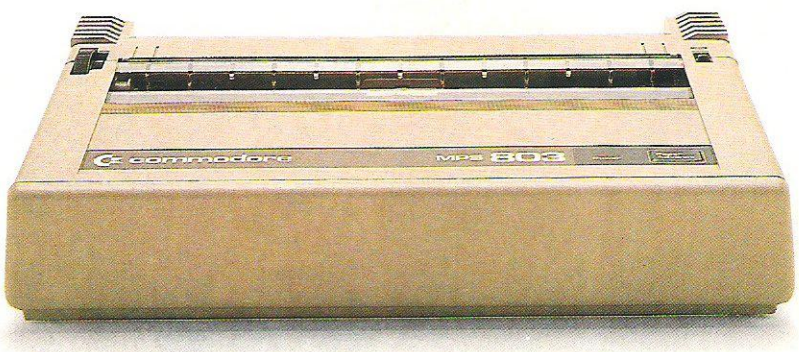

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238 Muswell Hill, Broadway, Muswell Hill, London N10.
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Adams World of Software, 779 High Road, North Finchley, London N19.
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Kent Microcomputers, 57 Union Street, Maidstone, Kent.
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Joe Micro (Rhyl Computer Centre), 20 Russell Road, Rhyl, Clwyd.
MU Games, 245 High Street, Slough.
Hobbyte, 10 Market Place, St. Albans, Herts.
The Model Shop, 22 High Street, Stroud, Glos.
L & J Computers, 192 Honeypot Lane, Queensbury, Stanmore, Middx.
Bucon Microstore, Swansea.
JKL Computers, 7 Windsor Street, Uxbridge, Middx.
Bell & Jones, 39 Queen's Square, West Bromwich.

Insights Into the Plus/4

Got a Plus/4? If so, read on for some fascinating insights provided by Bill Donald.

The PLUS/4 has been much neglected by software houses, authors and programmers alike. The purpose of this article is to redress the balance and provide you, the reader, with some insights into this very interesting, and as you will see, versatile machine. First we must look at the 8501 cpu (central processor) of the PLUS/4 and partake in a little history lesson of the various cpu's used by Commodore in their personal computers.

The very first cpu used was the 6502 which started in the PET and finished its time in the VIC-20. This cpu had no facilities for input/output and where this was required on these machines, the 6520 PIA (peripheral interface adaptor) or latterly the 6522 VIA (versatile interface adaptor) were inserted onto the memory map using address decoders such as the 74LS154. The introduction of the advanced 6509 cpu in the 700 series (or B-series as they are known in the USA) was the first effort by Commodore at having on-board cpu input/output ports. The addresses selected were $0000 and $0001 which were the data direction and input/output port respectively and this was carried over into the C64 in the 6510 cpu.

processor	addressable memory	machine used in	input/output port
6502	64k	PET, VIC-20	no
6503	4k	- - -	no
6504	8k	4040, 8250 Drives	no
6505	4k	- - -	no
6506	4k	- - -	no
6507	8k	- - -	no
6509	64k	700 Series	yes
6510	64k	C64	yes
7501	64k	C16	yes
8501	64k	PLUS/4	yes
8502	64k	C128	yes

The major benefits of having this port incorporated into the cpu was to allow either a larger amount of RAM by releasing memory locations or user ROM's to be interfaced without difficulty. There was also the inherent problem of a maximum of 64k *directly addressable* by the 8-bit cpu's. The B-series were more directly concerned with RAM hence the introduction of 128k machines which were expandable to 256k, whilst the C64 was firmly led in the ROM expansion direction, which according to Commodore was a maximum of 32k. A loose protocol of expansion in 16k blocks was employed which was broken by the introduction in 1984 of the 75xx series of 1984 in the C16 and 85xx series of 1985 in the PLUS/4.

You will note that the later cpu's are all fitted with input/output ports. There is a conflict of interest here since the market wanted larger memories whereas Commodore using 8-bit technology were able to overcome the 64k addressable RAM problem by bank switching. In terms of bank switching the 8501 cpu can contend with a total of 96k in six 16k blocks, whilst the 8502 cpu of the C128 can take thirty two 16k blocks, which give it an unrivalled expansion of 512k amongst the Commodore 8-bit machines. I mentioned earlier that the C64 is capable of only supporting 32k, the official reason for this is due to address bus TTL load limits. However, this has been elegantly overcome in the COMAL 80 cartridge which uses two 64k ROM's which have a similar buffer load capacity to earlier less capacious ROM's. The COMAL 80 card is interesting from a hardware engineering standpoint for several reasons and I hope to present an article on it soon.

The memory map of the 8501 is radically different in some places from that of the 6510. At addresses $0000 and $0001, the data direction and input/output ports are located as usual. The TED processor (8360) appears in ALL configurations of memory structure and sits at $FF00 to $FFIF. However, there are some bank switching routines built into the KERNAL ROM. This means that to use these routines the KERNAL must be enabled where necessary.

Let's concentrate for a moment on the C64 and PLUS/4 and look at these ROM overlays in detail. The ROM can be of two types, autostart or user initiated. During the reset sequence the cpu sets up the memory for a machine normal configuration and then checks the expansion port for the presence of a ROM or an additional board such as a VIA or second processor such as the Z80 CP/M module. In simple hardware terms it does this by the detection of a TTL load on several pins of the expansion port. If a ROM is found and the ROM header indicates an autostart the instruction sequence control is then passed to the ROM. This explains the difference in terminology in the C64 memory maps between GAME and EXROM, the former is autostarting and completely takes over the control of the 6510 cpu whereas the latter such as the COMAL cartridge still allows input/output on the serial bus, etc.

The PLUS/4 when you purchase it already contains an autostart ROM which, when called, does act as a C64 GAME ROM and completely takes over the machine. The BASIC ROM is switched out with the screen display and input/output very closely controlled. This is the famous, or infamous "Three-Plus-One" software of word processor, data manager and spreadsheet. So how does this feature work? Well, I mentioned earlier the two different types of ROM that the cpu could detect on the expansion bus. The PLUS/4 has some in-built routines which allow a GAME type ROM to peacefully co-exist by pretending not to be there.

But first, take a look at the actual expansion port of the PLUS/4. You will see that instead of the familiar 44 pin port of the C64 and VIC-20 the PLUS/4 expansion port has a total of 50 pins. Apart from acting as safety barrier for the prevention of inserting ROM cards meant for the C64 or VIC-20 the other reason for the extra pins is for the external ROM's or RAM chips. I have tabled below the function of each of these pins.

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Pin	Function	Description	Pin	Function	Description
1	GND	System Ground	A	GND	System Ground
2	+5 Volts DC		B	C1 LOW	External ROM 1 lower 16k address
3	+5 Volts DC	(maximum current 100mA on both these lines)	C	BRESET	Bus Reset
4	IRQ	IRQ to cpu (active LOW)	D	RAS	
5	R/W	Read/Write	E	0O	Dot Clock
6	C1 HIGH	External ROM 1 upper 16k address	F	A15	Address Bus bit 15
7	C2 LOW	External ROM 2 lower 16k address	H	A14	Address Bus bit 14
8	C2 HIGH	External ROM 2 upper 16k address	J	A13	Address Bus bit 13
9	CS 1	External ROM select (ROM 1)	K	A12	Address Bus bit 12
10	CS 0	External ROM select (ROM 2)	L	A11	Address Bus bit 11
11	CAS		M	A10	Address Bus bit 10
12	MUX		N	A9	Address Bus bit 9
13	BA	Bus Available from 8360	P	A8	Address Bus bit 8
14	D7	Data Bus bit 7	R	A7	Address Bus bit 7
15	D6	Data Bus bit 6	S	A6	Address Bus bit 6
16	D5	Data Bus bit 5	T	A5	Address Bus bit 5
17	D4	Data Bus bit 4	U	A4	Address Bus bit 4
18	D3	Data Bus bit 3	V	A3	Address Bus bit 3
19	D2	Data Bus bit 2	W	A2	Address Bus bit 2
20	D1	Data Bus bit 1	X	A1	Address Bus bit 1
21	D0	Data Bus bit 0	Y	A0	Address Bus bit 0
22	AEC	Address Enable control line	Z	NC	Not Connected
23	EXT	External audio input	AA	NC	Not Connected
24	02	2nd phase system clock	BB	NC	Not Connected
25	GND	System Ground	CC	NC	Not Connected

These external ROM's are decoded from address $8000 upwards in two 16 blocks. The break point between the upper and lower blocks is situated at address $C000. You can see that the PLUS/4 allows the blocks to be multiplexed and any combination of internal and either external ROM to be addressed by the cpu. The hardware of the PLUS/4 recognises each block or bank by designating it a number, these banks are as follows:–

BANK NUMBER	ROM Description
0	KERNAL
1	INTERNAL
2	EXTERNAL 1
3	EXTERNAL 2

In order to determine which combination to select the programmer must define to the TED bank switching memory an offset indexed by the X register. The ROM bank switching table is located between $FDD0 and $FDDF and is constructed thus:–

If this looks intimidating, do not worry it isn't as complex as it first seems. Commodore have allowed us the use of in-built routines which I mentioned earlier to simplify matters. For the benefit of those readers who like to know such things the technique of bank selection operates like this. Take the Bank Numbers of the ROM's you require, i.e. 0 to 3 and translate these values into 2-bit binary values. For example, 0 = 00, 1 = 01, 2 = 10, 3 = 11, remember you can only have two! Add these binary values together, for example KERNAL (00) and EXTERNAL 2 (11) which is equal to binary value 11 (00 + 11), or hex value 3, EXTERNAL 1 (10) and EXTERNAL 2 (11) which gives (10 + 11 = 101) or hex value 5. Using the determined hex value in the X register as an offset, store an arbitrary value using this offset as an index against $FDD0. In other words, the program would look like this:–

```
LDX #$05; offset value determined as above
LDA #$00; use any value here it does not matter
STA ($FDD0),X; select bank
```

I hope that I haven't swamped your neurons with too much information at once and you find the PLUS/4 as interesting and as fascinating as I do. In future issues I will be looking at using the LONG FETCH and LONG JUMP routines of the PLUS/4 as well as such topics as second processors, inter-machine communications and more about ROM's.

TO BE CONTINUED

Address	Bank	HIGH Bank	LOW Bank
$FDD0	0	KERNAL	BASIC
$FDD1	1	KERNAL	Internal LOW
$FDD2	2	KERNAL	External 1 LOW
$FDD3	3	KERNAL	External 2 LOW
$FDD4	4	Internal HIGH	BASIC
$FDD5	5	Internal HIGH	Internal LOW
$FDD6	6	Internal HIGH	External 1 LOW
$FDD7	7	Internal HIGH	External 2 LOW
$FDD8	8	External 1 HIGH	BASIC
$FDD9	9	External 1 HIGH	Internal LOW
$FDDA	10	External 1 HIGH	External 1 LOW
$FDDB	11	External 1 HIGH	External 2 LOW
$FDDC	12	External 2 HIGH	BASIC
$FDDD	13	External 2 HIGH	Internal LOW
$FDDE	14	External 2 HIGH	External 1 LOW
$FDDF	15	External 2 HIGH	External 2 LOW

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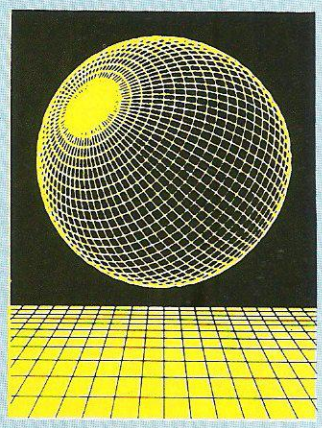


The 1985 Computer Animation Film Festival demonstrated the amazing progress made in this art/technology in recent years", says Eddie Dawe, marketing manager of Online International.

Online are the organisers of the Computer Graphics 85 exhibition held in London recently. The fourth Computer Animation Festival was just one of the highlights of the four day show.

Experts from all fields of computer graphics lectured on their specialist areas, while companies exhibited their latest products.

Well-attended seminars covered Holography and Commercial Applications; Computer Animation and Video Effects; Business and Information Graphics; Engineering and CAD – Integration; and Computer Animation and Video.

"The complete event demonstrated the buoyancy of the entire computer graphics market", says Dawe.

The whole field of computer graphics is constantly becoming more spectacular, particularly with the superb graphics capabilities of computers such as the Amiga.

There are, however, still misconceptions as to its current state in certain areas. Lecturer/artist, Andrew Pepper, who gave a seminar on holography, says: "Display holography has a curious ability to generate excitement far beyond its capabilities".

This serves to inflate expectations of the holography. He says: "It will be a few years yet before the entertainment industry will be able to project an entire rock band over the audience!"

Holography is just one of the areas of computer graphics which CCI will be covering in future issues. Meanwhile, pencil the dates of Computer Graphics '86 into your diary – 14-17 October 1986.

Quest (A Long Ray's Journey into Light)

The Computer Animation Film Festival 1985 'State of the Art' award went to the Apollo Computer Company for their piece of the future (pictured above) called 'Quest: A Long Ray's Journey into Light).

As you can see from the still, it is really a spectacular piece. Apollo (American manufacturers of high-powered work stations) made use of the local area network to accomplish this task.

Responsible for much of the technical direction behind Quest is Apollo's Jim Arvo. He says: "We wanted to experiment with distributive computing and we wanted to make a movie.

"We chose to use ray tracing – an expensive method of animation using algorithms to produce realistic pictures."

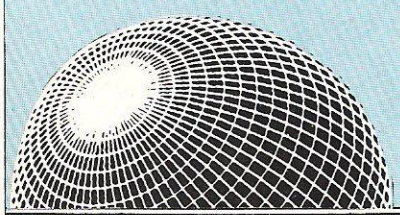
Typically, ray tracing takes hours to produce just one picture. This is where Apollo made use of networking.

Arvo says: "We have the use of several hundreds of work stations. We had 108 different computers working in parallel.

"The finished piece is only three minutes long, but required 50,000 man hours. It wouldn't have been possible without the local area network."

It certainly wouldn't have been ready in time for the Festival 50,000 hours is five years, seven months, and that's without sleep!

Quest was created using EM6600/6400 mainframes.



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* Note due to memory limitations ACE on the C16 and VIC20 (+8K Ram) do not have any ground objects.

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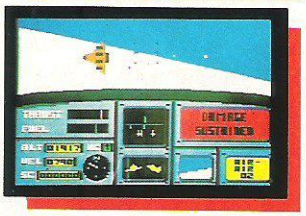

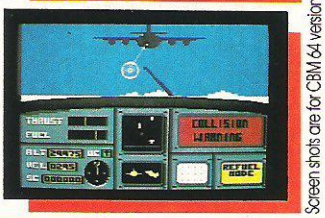

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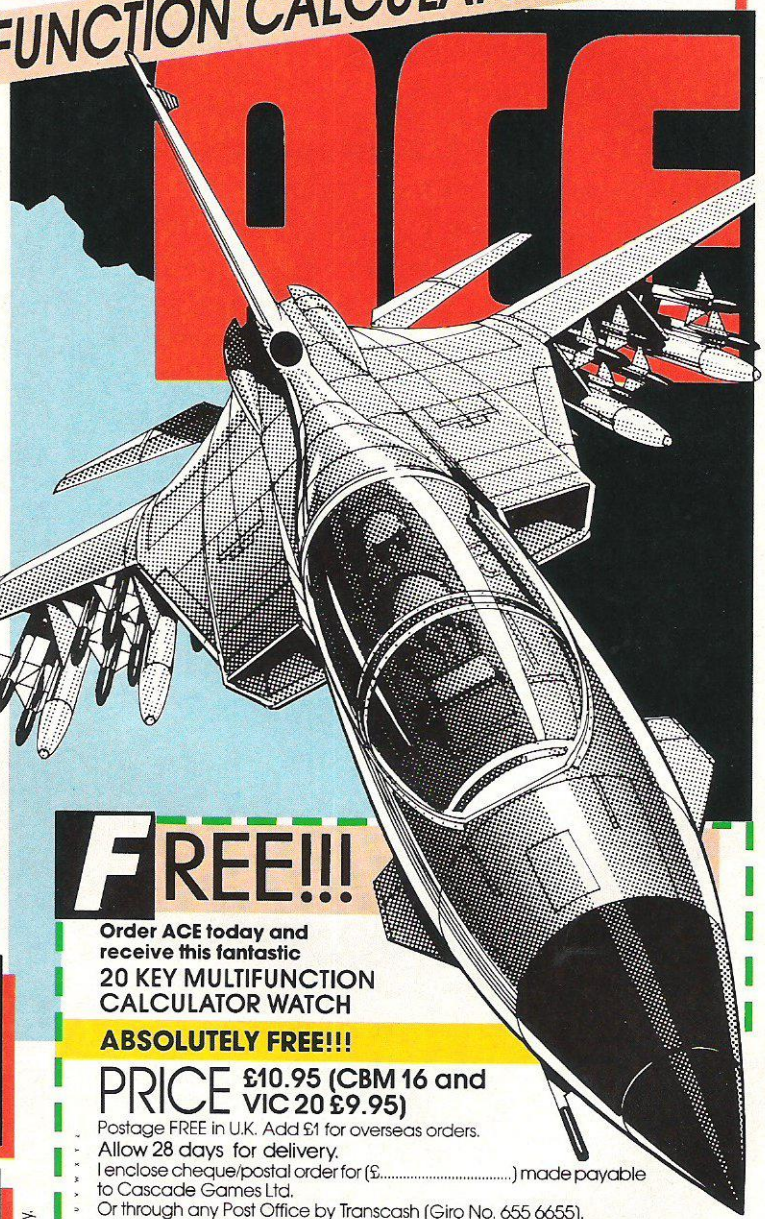

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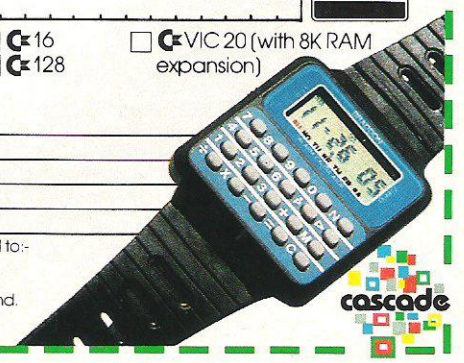

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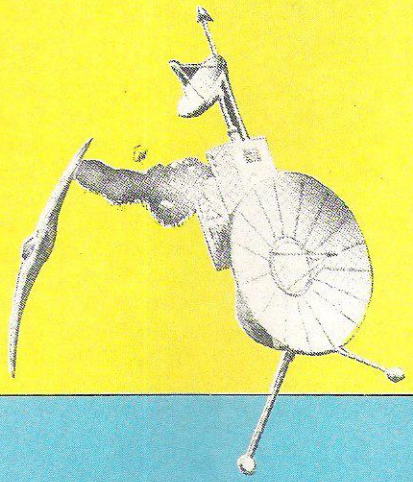


The CCI Readers' Panel try their hand at Domark's Codename Mat II

Probably the most mixed panel ever on this one. Domark's games have always aroused more than a little controversy, the reviews of A View to a Kill prove that, and I feel Codename Mat II (£8.95) will keep up that reputation.

Craig Pemberton, of Bootle, Merseyside describes the game's scenario thus:-

"As the sole defender of a satellite powergrid (sort of celestial pylons!), you have to beat off attacking aliens (haven't we heard this somewhere before?). Destruction of any one of these satellites breaks the circuit and prevents your score from increasing."

The game's screen display is well described by Corporal Ruckwood of Bordon, Hants:-

"The graphics are simple but colourful, but when you consider the graphics capabilities of the 64, they are not that impressive. There is only a simple split-screen cockpit display showing your control panel against a baron starfield."

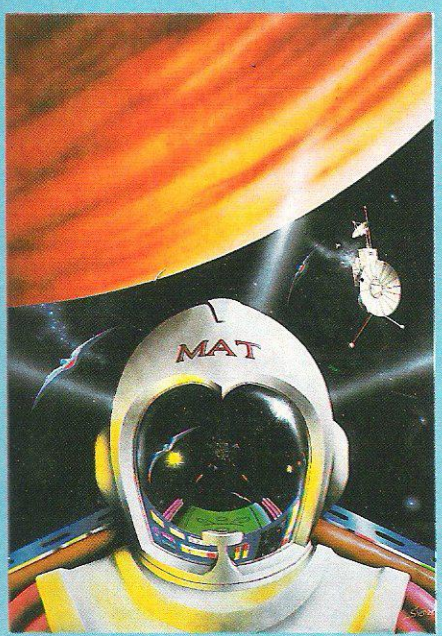
Many of the game's ideas can be seen in much earlier Star Trek derivatives, although Domark have improved on many of the more mundane points of its predecessor. Mrs E O'Brien of Madeley, Nr Crewe, liked the game very much, and commented on the instructions and instruments:-

"There is a whole sheet full of instructions for this game and it needs to be studied well, but is easy enough to understand. Status reports are given, and during a quiet period (of which there are many! FKJ) you can practise flying and warp speeding techniques. Long and short range scanners are also available, so there is lots to do, and you are constantly in control of the game."

As Codename Mat, the original game, was never released on the 64 (only the Spectrum) it seems odd that Domark should decide this to be the name of this game. In my view the biggest problem this game has is its amazing similarity to its Speccy brother. The graphics are so close it's ridiculous!

M. Younger of Stockport, did not agree with Mrs O'Brien when it came to the instructions and ease of play:-

"At first I did not understand the game and on close examination of the instructions I found that there was a total of 30 different keys used to play the game!"



Kevin Exley of Stourton, Leeds, really didn't enjoy the game, and his first comments sum up his feelings well:-

"You can't get water out of a dried up well, and that, for me, unfortunately applies to this game. If you are going to recreate a game from the 'old' Star Trek mould, then it must have plenty of gimmicks to endear it to the buying public – and Codename Mat II doesn't."

Although at least two of our panel seemed to like the game, I would venture to say that it is not a game that is outstanding amongst the illustrious company it must keep if it intends to be a success.

Each of our panel summed the game up very well, with their own views put over very clearly, so I'll leave it to you to decide whose views to take, after all they are readers, just like you!

Conclusions:

"All you really have to do in this game is find and kill alien ships, which makes the game very boring and not really worth the money. There are many better games around, so spend your money on one of them!" – Younger.

"The graphics and sound are very good, with a colourful dashboard surrounded by black space with lots of stars thrown in for good measure. On the whole it is a very well thought out game, very realistic, with lots of action to keep you busy, well worth buying in my opinion." – O'Brien.

"Altogether Codename Mat II has a fairly dated plot with disappointing sound and graphics, and once a few waves have been completed there is no real incentive to continue. Definitely not one for the collection." – Ruckwood.

"Underneath Codename Mat II's glossy shoot-em-up veneer there is a well thought out game of strategy which I feel will appeal to arcade fans and adventure buffs alike. It has something you can't quite put your finger on and proves that graphics and sound aren't everything." – Pemberton.

"In conclusion, I feel this game is very disappointing, lacking any originality or vision. Not a game I would recommend;in fact, one I would sweep under the 'mat'!" – Exley

Contact: Domark, 204 Worple Road, London SW20 8PN. Tel: 01-947 5622.

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8 Blasters at G 8 in-range
3 Cannons at D 9 broken

Due for launch in the new year, the three titles already announced are: Hardball – a baseball game with outstandingly large and well defined characters; Law of the West – a western set quick-draw game; and The Psi-5 Trading Company – a sort of intergalactic salesman's game (see pic).

From what I have seen, they really should be excellent, and I hope to get a review in next month's issue.

In some quiet dealings during the recent PCW show, US Gold signed contracts giving them sole licensing rights to the graphically outstanding Accolade range of games.

COMPILED YAK

Jeff Minter, alias Yak the Hairy, has announced his latest product. A compilation of all the Minter classics called Yak's Progress. Nine, no less, really excellent games on a single disk or twin-tape package. If you've yet to purchase a Minter game, get this one. You can't fail but enjoy it, more next month.

Price: £9.45 twin – tape. £11.95 disk.

Contact: Llamasoft Ltd, 49 Mount Pleasant, Tadley, Hants. Tel: 07356 4478.

NOW HEAR THIS!!

After the success of Now Games, Virgin have decided to release Now Games II in time for Christmas, consisting of Airwolf by Elite, Tir Na Nog by Gargoyle, Cauldron by Palace, Chuckie Egg II by A'n'F, and World Cup by Artic. Basically it means you get £45 of software for less than 1/4 price. Bargain or what?

Price: £8.95

Contact: Virgin Games Ltd, 2-4 Vernon Yard, 119 Portobello Road, London W11 2DX. Tel: 01-727 8070.

MORE BUDGET BUDGIES

Tales of the Cat is the latest £2.99 release from Budgie Software. It puts you in the role of a forlorn cat, travelling along the side of the road. To succeed in the game you must travel along, dodging various articles that fall from houses and elsewhere.

To make life worse, you must avoid a dog and run on and off the road. It sounds like a dog's life to me (Groan! Not another pun! Ed).

Contact: Rino Marketing Ltd, 1 Orange Street, Sheffield S1 4DW. Tel: 0742 739061

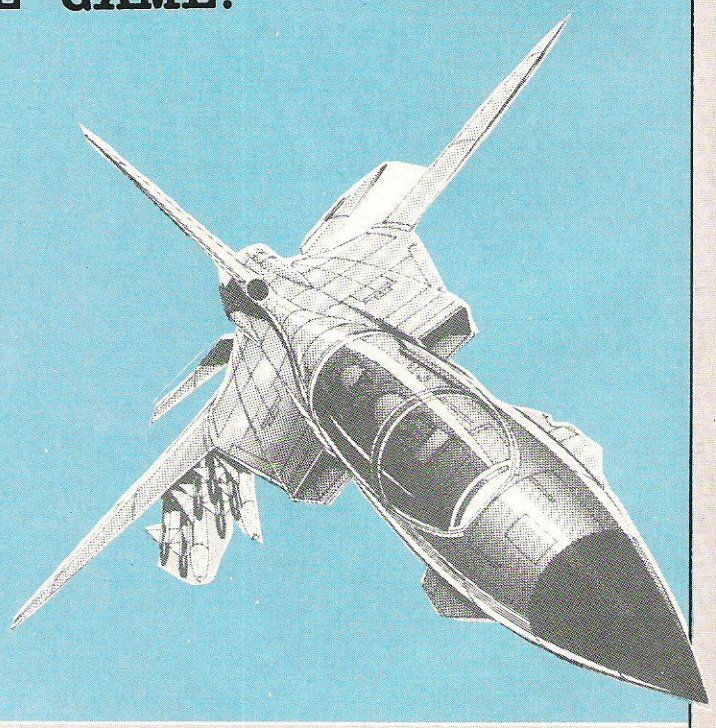
WHAT AN ACE GAME!

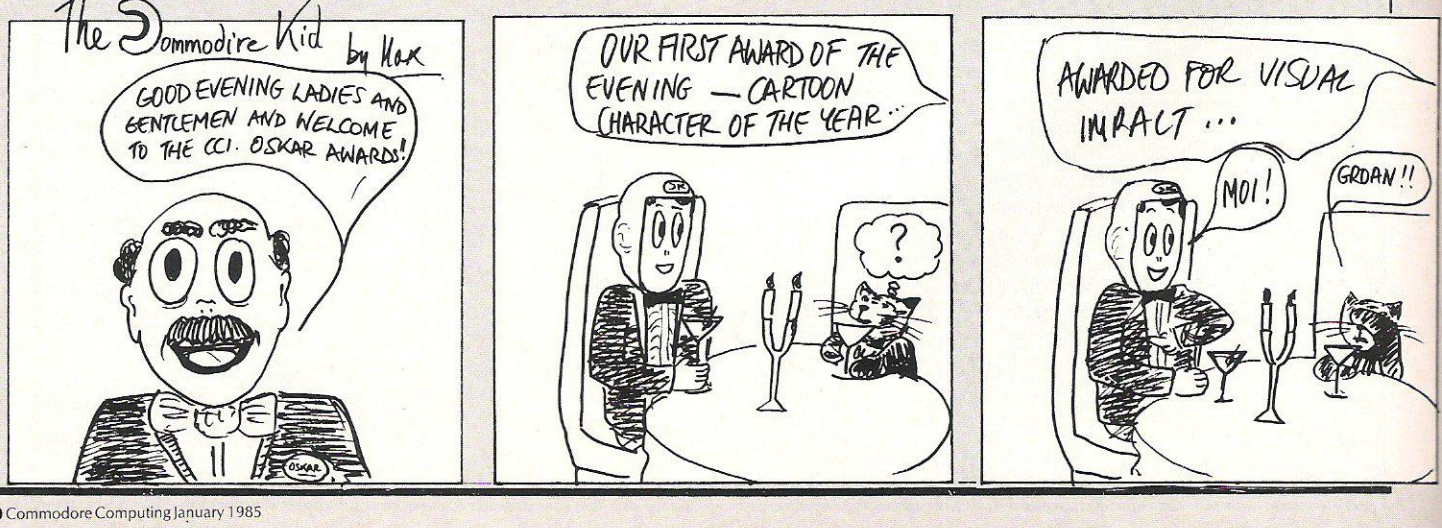
Cascade, known for their 50-games package, have recently released Ace, a new and very superior flight simulator for the 64. Although there will be a full review next month, suffice it to say that had it been out earlier in the year it would have been a contender for our Simulation of the Year Oskar.

Graphically very good, it manages to feature the elusive qualities of playability, that most simulations do not have. For full details read next month's mega-reviews!

Price £9.95

Contact: Cascade Games Ltd, 1-3 Haywra Crescent, Harrogate, North Yorkshire HG1 5BG. Tel: 0423 504526.

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DYNAMITE?

Mirrorsoft's latest character for the 64 has finally arrived, and if you're a fan of ledge games, he should really appeal! Dan is a nicely-defined medium-sized character who looks suspiciously like someone I know from the games industry (eh Andy?), with red hair and Demob type top.

Having landed his Zeppelin, Dan must save the world from the dastardly Doctor Blitzen by blowing up his safe, which contains the doctor's evil plans.

Having played the game, I can safely say that it is very true to the Speccy original – too true perhaps? Nice music though! Full review next month. Dynamite Dan costs £7.95.

Contact: Mirrorsoft, Maxwell House, 74 Worship Street, London EC2. Tel: 01-377 4600.

THE ULTIMATE CHRISTMAS

After less than rave reviews for Imhotep, Ultimate have announced two more games that should just be out by the time you read this. Dragon Skulle and Outlaws will both be packaged in Ultimate's twin-cassette packs and have both got the usual wonderful artwork.

Unfortunately I couldn't get reviews for this issue, but I'll do an in-depth twin reviews next month. Hopefully they'll have been produced in-house, and not by the man responsible for Imhotep.

Price: £9.95 each.

Contact: Ultimate Play the Game, The Green, Ashby de la Zouch, Leicestershire LE6 5JU. Tel: 0530 411485.

QUESTIONS DEMANDING ANSWERS

From what I can tell Alligata are releasing a trivial pursuits type game. Called 'Quiz Quest', the press release was so cryptic that price and availability will have to wait until next month. Anyway, if you want one of these games you'd better wait to see what Alligata can do.

Contact: Alligata Software Ltd, 1 Orange Street, Sheffield S1 4DW. Tel: 0742 739061.

BRIDES GET GOING

St Brides School, in Donegal, Ireland have recently announced their newest game, The Snow Queen. A 64K adventure loading in two parts, I have yet to see the finished product; but if the free Novelette you get with it is anything to go by it ought to be a mega-time killer!

I'm not sure of the price as I couldn't get through to them at time of press, but I'll let you know next month.

Contact: St Bride's School, Burtonport, County Donegal, Ireland. Tel: 010-353 75 42030.

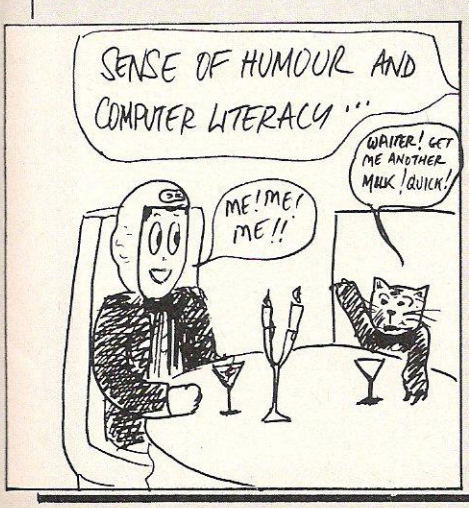
SCOOBY-DOOBY- DOOOOOOO!!

Due out for release recently, but delayed due to problems, Elite's Scooby-Doo might just be out before Christmas. Described as a computer-cartoon, it features all the loved (eh?) characters such as Scooby, Shaggy and Thelma.

Steve Wilcox, Sales Director of Elite describes it thus: "The best comparison we can draw is with the lazer disc games, the players role is very much as a director of an interactive cartoon", but then he would, wouldn't he?

Price: £7.95 cassette, £11.95 disk.

Contact: Elite Systems Ltd, Anchor House, Anchor Road, Walsall WS9 8PW. Tel: 0922 55852.



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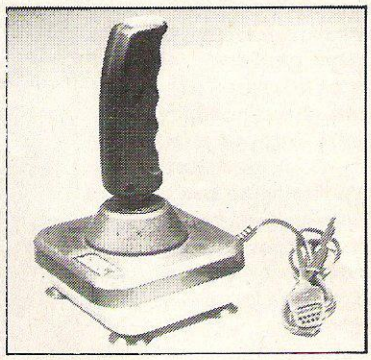

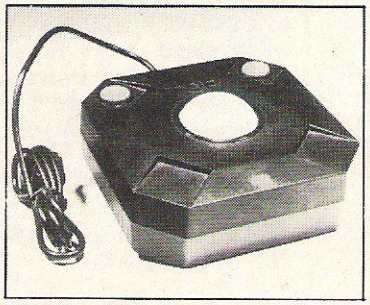

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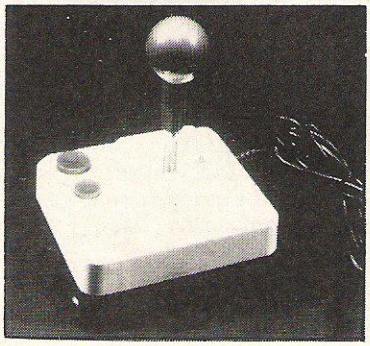

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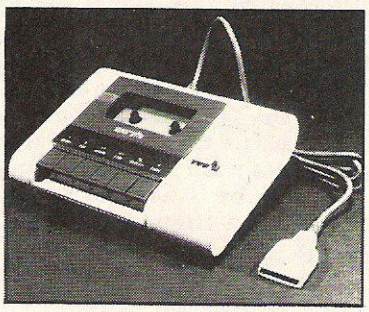

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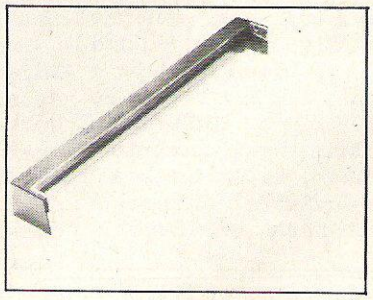

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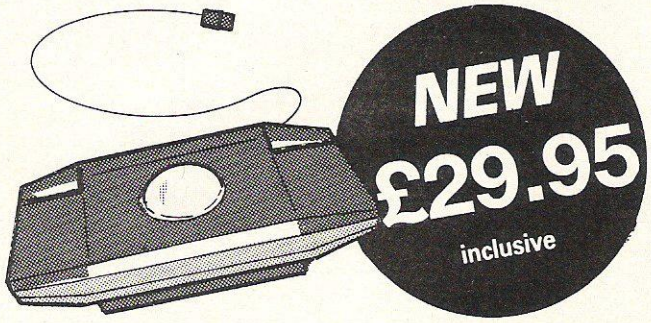

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Mega-Review

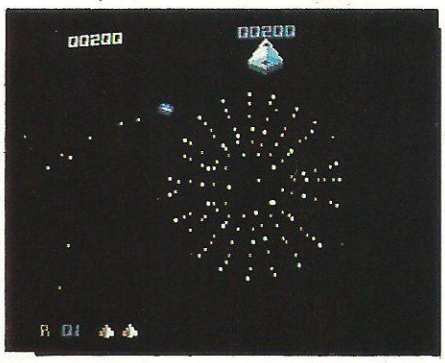
CRAZY COMETS

It's games like Crazy Comets which put the 1541 to shame! Loading in less than one minute, it makes me wonder why anyone uses Commodore's appallingly slow drives anyway?

As Martech's latest release – somewhat surprising as I had heard about very little apart from Geoff Capes for quite a while – I wasn't quite sure what to expect; and my first glances gave me a worrying feeling.....

"Another shoot-em-up? In this day and age? Did they seriously think? Martech? Hang on a minute, you can move a bit high can't you? Those round things, they've got bigger, look they're proper globes, and they're spinning round! Listen to that music, incredible! All that out of the 64 sound chip."

That, in my view, will be the typical reaction of people when they first see Crazy Comets. It looks like another shoot-em-up it even plays like a shoot-em-up, but **if you want a game to show someone what can be done with a little imagination on the 64, this is it!**



Every month I have been getting games with exceptional music. Crazy Comet, along with a select few others, must rate as the best I have seen. It goes on for so long without repeating, and some of the bass and drum breaks are brilliant. The day they let this guy loose on an Amiga I want to be there!

If you are a fan of shoot-em-ups this game should appeal greatly all round. If not – buy it, plug your 64 into your stereo, put some headphones on and listen to the music.

Fast Loader: Very!
Graphics: ★★★★
Sound: ★★★★★
Playability: ★★★
CCI Rating: ★★★★
Price: £7.95
Contact: Martech, Martech House, Bay Terrace, Pevensey Bay, East Sussex BN24 6EE. Tel: (0323) 768456.

CRITICAL MASS

This really is a preview! Although the Spectrum version of this game is finished, the 64 version most definately isn't, and what I saw on the 64 was a raw-code pre-anything version!

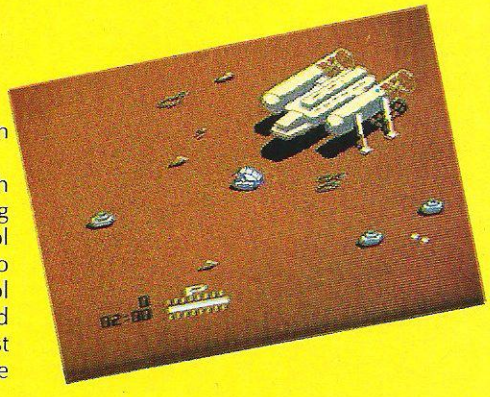
Ron Jeffs, the programmer of Critical Mass for the 64, came up from Taunton to show me the game, and from what I saw it is an impressive piece of work. Having previously programmed Combat Lynx for the 64, Jeffs has a quality background in games programming.

Critical Mass is all about getting through various stages of the game and destroying the reactor before it explodes. You control a skidoo (a small spacecraft that seems to hovver), and having chosen which control pattern you prefer-Normal or Vectored (vectored is anti-gravity) - you must complete various stages and shoot the reactor.

Although there was no sound (bar a few effects) when I saw the game; a sound track is being produced, and promises to be of a high quality. Graphically Critical Mass is excellent, with some great little spinning objects and great animation. When finished it should be really special.

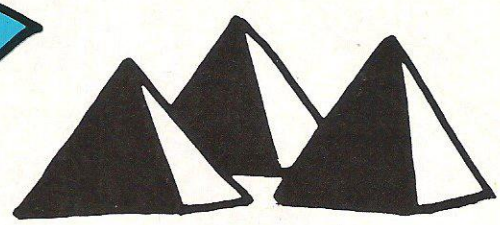
There should be six or seven levels to complete when the game is completed, with five skill levels. The stages I saw all had different and interesting features, and the final one promises to be truly spectacular.

I only saw bits of the game, and even they weren't totally finished, but I got a good impression of what promises to be a smash hit. It should be in the shops before christmas!



Mega-Review

IMHOTEP



IMHOTEP

Ultimate have been criticised recently for the lack of originality shown by their 64 software, which was of undeniably high quality, if a little predictable. When Imhotep was announced however, I was interested to note that there was no mention of Sir Arthur Pendragon.

When the game arrived I was a little disappointed with the overall finish of the program. As always, the packaging and instructions are of extremely high quality, the game however lacks real substance to get you hooked.

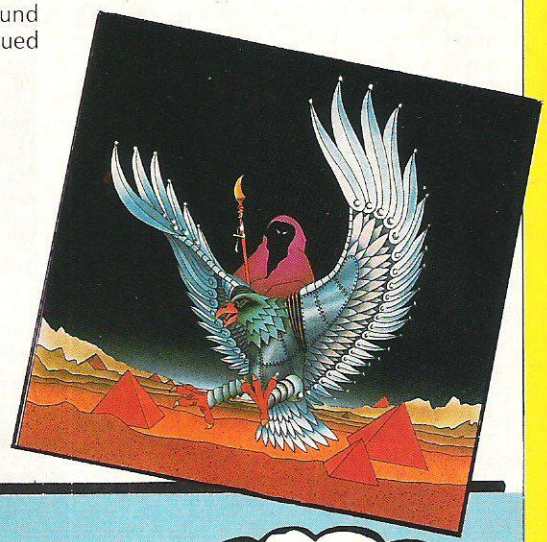
Unlike their previous game, Blackwyche, there is no attractive loading display, and the music plays only while you watch the title screen, not during play. Graphically Imhotep is attractive, with some faultless left to right scrolling, but the very difficult first section is so laborious that I can see many people getting very bored trying to successfully complete it.

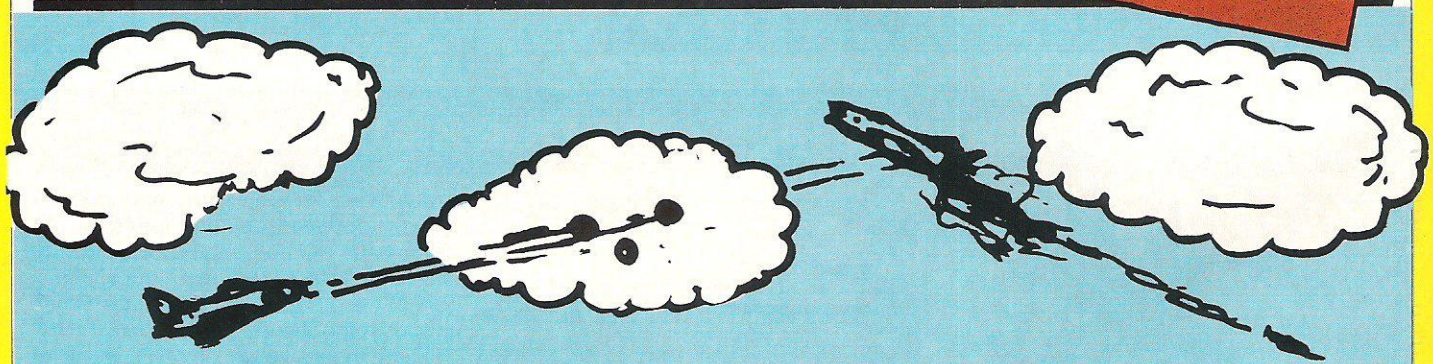
With very few sound effects, except for pretty primitive fire and explosions, I found the game had very little to keep you glued to the screen with.

Overall Imhotep is not a bad game, but from a company who has gained a reputation for quality it looks as if Imhotep was rush released to capitalise on the Christmas market, and this is a pity.

Fast Loader: Novaload
Graphics: ***
Sound: ***
Playability: **
CCI Rating: ***
Price: £9.99

Contact: Ultimate Play the Game, The Green, Ashby de la Zouch, Leicestershire LE6 5JU. Tel:





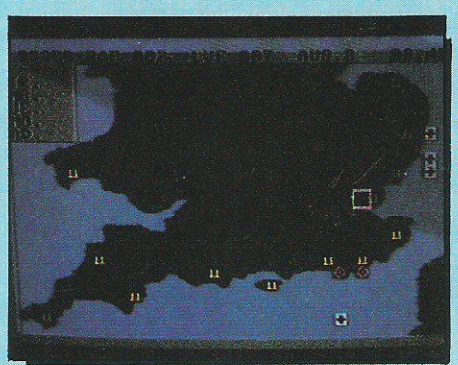
BATTLE OF BRITAIN

'Never has so much been owed by so many to so few.' This quote really doesn't have a lot to do with my review, but working on a computer mag, it's nice to use a quote from Winston Churchill sometimes!

Quite what Churchill would have thought of the latest in PSS's Wargamers series I'm not sure, but he would surely have enjoyed it.

Battle of Britain is an attempt to give Wargaming a mass market without giving up the 'real life' scenarios. In many ways I was surprised how easily the game plays. Although it is recommended to read the whole manual (must be at least 8 pages! Ed), I found that it's more fun to jump straight in on a basic game and let Ginger take on the baddies! What ho!

For the more serious wargamer, BOB has some pretty mean little games, Blitzkrieg in particular is so fast that



sometimes it can get quite out of hand. The options are wide ranging also, and if you decide to play to full Campaign, you can save the game easily.

What made the game stand out for me, however, was the occasional break from the tactical map screen to take on some baddies properly, blowing them out of the sky! Having two arcade sections, air-to-air and land-to-air, both well programmed (especially considering what else the game has in it) is pretty impressive.

The graphics are not spectacular, with a nice representation of southern England for the tactical sections, and average animation for the arcade sections. In many ways this is not important, the game does not rely on its visual effects, but more on the overall feel.

Surprisingly the sound is very good, with neat effects, and a great finale anthem. If you are a war games fanatic, you'll more than likely have the game in front of you, if not, maybe this one will change your views.

Go on! Do it for Blighty!

Fast Loader: Yes
Graphics: ***
Sound: ****
Playability: ***
CCI Rating: ****
Price: £9.95
Contact: PSS, 452 Stoney Station Road, Coventry CV6 5DG. Tel: 0203-667556.

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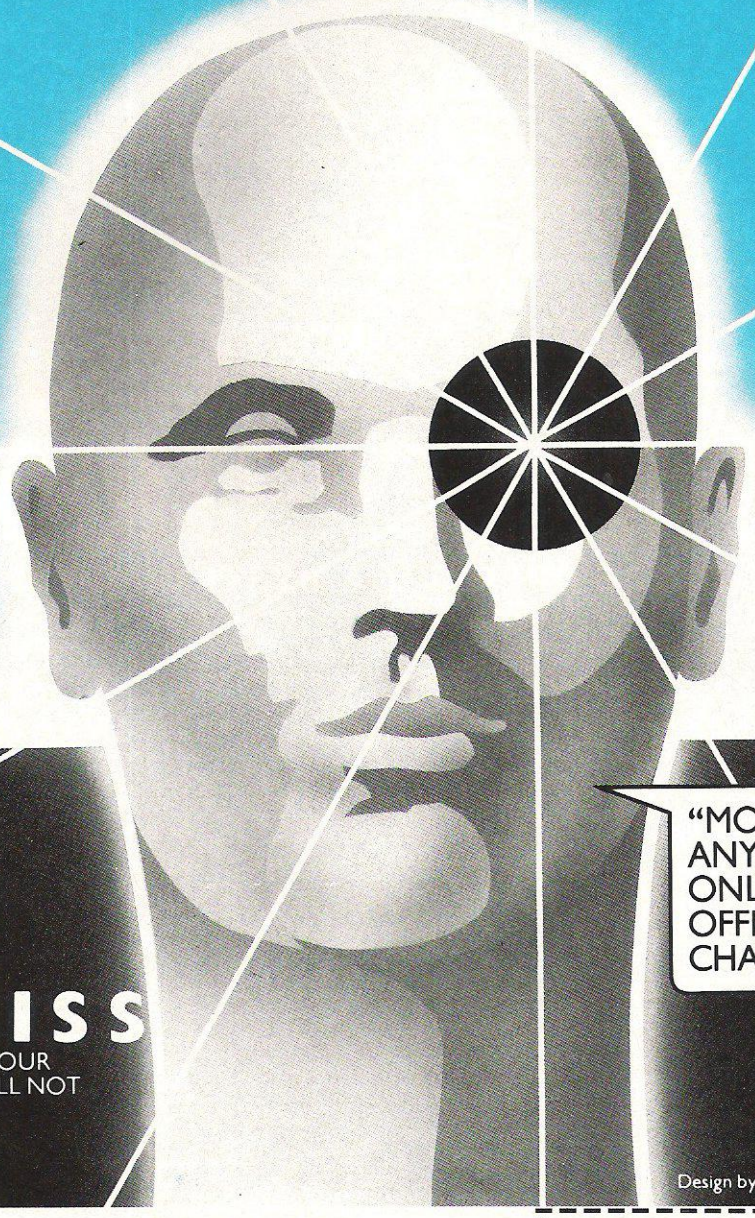

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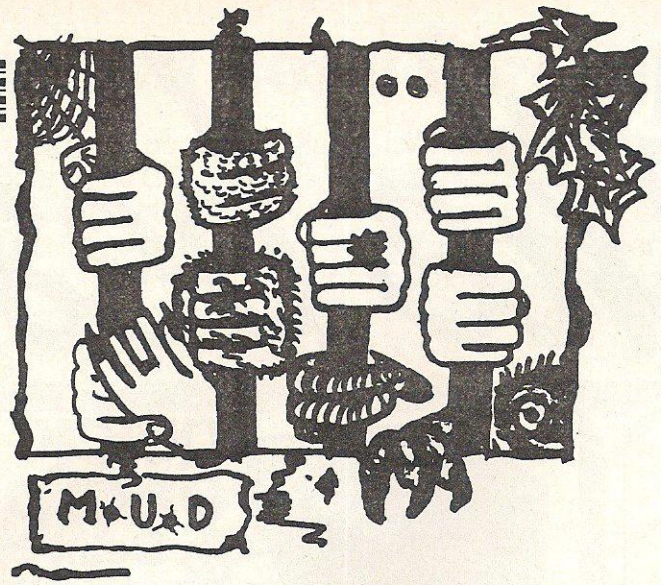

Zaphod returns to the MUD page with news of some interesting changes... one of which being his recent promotion to Arch-Wizard. Congrats!

Well here I am again! First of all I must put right something I said in the previous article about Kate the Witch. She claims that she did not leave MUD because of being insulted by an arch-wizard, which I said last month. If this is the case then I apologise, Kate!

Secondly, if you do want to get in touch with Compunet about playing MUD, then here is their new number for they have moved to bigger and better offices: 01-965-8866.

A major change has taken place in MUD since last month. For a start the price per hour has been cut by almost half to only £1.75, and since then, usage of the game has shot up enormously. It is now quite common to have 15 plus players on the game at once. This may not sound like a lot but believe me – if you are a mortal trying to get a lot of treasure then with 15 other treasure hunters you gotta be quick and ruthless. These two factors, price and usage, have vastly improved the game and made it much more fun to play. Even some Essex players have agreed that the game is now a 'proper' MUD.

Arch-wizards appointed

You may remember that in my last column I was complaining about the monopolisation of Compunet arch-wizards by Essex people. Well, following my own and several other wizards' complaints, three new arch-wizards have now been appointed to take over from the old Essex ones. They are Kate the Witch, David the Wizard, and yours truly – Zaphod the wizard. At the moment we are having to play as Debugger the arch-wizard, because with MUD2 still having the final touches put to it, MUSE does not have the time to recompile the game (arch-wizards are hard-wired into the game and the game must be re-written to change their names). So the four current arch-wizards are Kate, David, Mephisto (playing as Brian at present) and myself.

Last month I mentioned that there were a few wizards who were playing badly. This has now greatly improved with only one or two still misbehaving. Generally play has improved all round and that includes the mortals who used to whine on and on for treasure. This has now stopped. It did, however, take a few threats of dire consequences to get them to stop.

Valley is STILL not being used! There is an expanse of 96 odd rooms in there which hardly anybody bothers to use. Just think of the amount of treasure lying about there .....with nobody picking it up! Thousands of points worth.....ho ho ho.....just to get your appetites going! So remember – next time you play MUD be sure to go to Valley (east from the start).

Recently you may have seen a persona called Sue playing, and she was at first thought to be a wizard playing as a mortal. However, she is really Sue the Essex arch-wizard playing as a mortal and is definitely the best player I have seen on Compunet in ages. She has been climbing towards wizard at a terrific rate, even after having been killed off several times. In fact, by the time this article is published, it wouldn't surprise me if she makes wizard (or should I say witch?).

Hackers beware!

Compunet MUD has had its first real persona hack, and I am going red as I write this because it was my persona, my very own Zaphod, who was hacked. In fact it was really my fault because I forgot to change the password after demonstrating MUD at the Commodore Horizons Show. The hacker shall remain nameless, but suffice to say that he came on as me and proceeded to go around the game messing around with mortals' scores. He also started to force other wizards to quit MUD when they didn't want to, with the BYE command. To catch the culprit we ensured that there was always a wizard on the game and finally he obviously found the temptation to have another go too much to endure. He came on again and accidentally gave himself away. The punishment has not yet been decided, but it seems likely that he will be banned from MUD for a month and will never be allowed to attain the rank of Wizard. So if any of you have ideas about hacking into MUD personas don't try it; you are bound to be caught in the end.

I have been re-living my days as a mortal in the last few weeks. I found it quite refreshing to play MUD as a mortal again, for even wizards get tired of snooping on people! Going around MUD incognito is also a very good way of seeing how wizards behave, because as a mortal you are on the receiving end of any bad behaviour on their part! Highly recommended for any wizard who finds himself getting bored of wizardship.

As a mortal you may have had the experience of being talked to by 'someone' which is, in fact, an invisible wizard or an arch-wizard. Arch-wizards can do the same thing to wizards but supposedly there was nothing above an arch-wizard – and hence arch-wizards should not get talked to by 'someone'. However, a few days ago I got a message: Someone is about to contact you with a wiz command: Someone tells you "bye for now!"

God of MUD?

This I thought nothing of for a few seconds.....until I remembered that I was playing as an arch-wizard! This would seem to indicate that there is a tier above arch-wizard, namely a god! Simon Dally of MUSE has confirmed this but says that the occasions on which 'god' (for lack of a better title!) is used are very, very rare.

MUD2 is finally up and running! Yes, it is true – no kidding – MUD2 is running! It is on alphatest mode, which means that you can play it without paying play time. This will continue for the next few weeks until the game has been fully debugged. Simon Dally who has been suffering from premature ageing due to his fretting about MUD2 has finally calmed down and relaxed. To quote one of his now-favourite expressions, "To err is human, but to really screw things up you need a computer." This, he says, he has learned from long experience. No longer is he considering committing suicide by jumping off the cliff without opening the brolly..... Seriously though, MUD2 looks very promising and I am sure that it will turn out to be well worth the wait. I look forward to seeing it when it is fully debugged and running at 100%.

I will bring you further snippets next month and hopefully a short rundown on MUD2.

Zaphod the arch-wizard has just disappeared in a puff of smoke.

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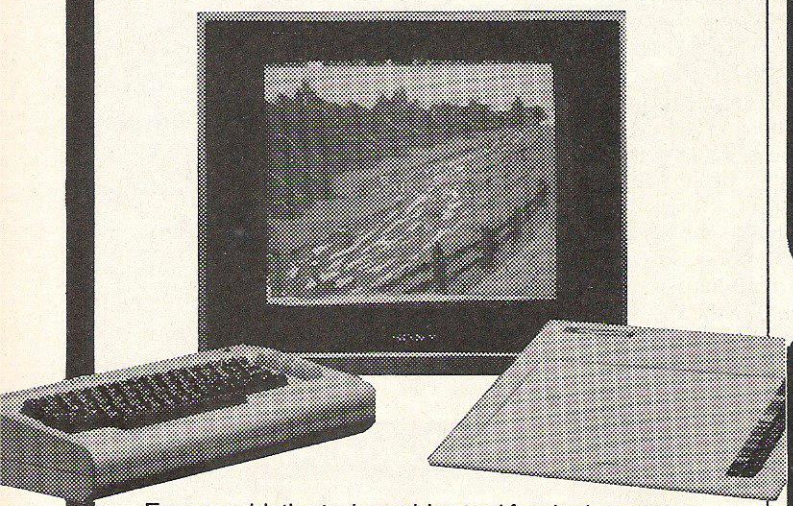

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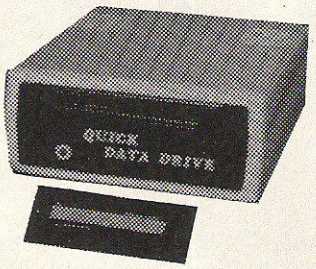

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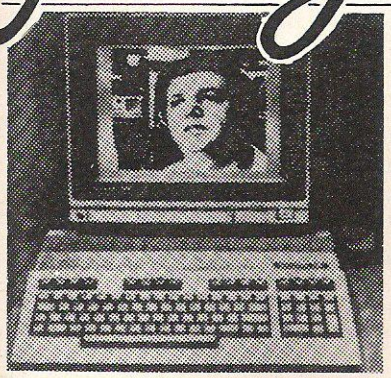

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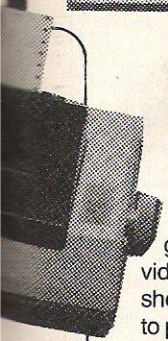

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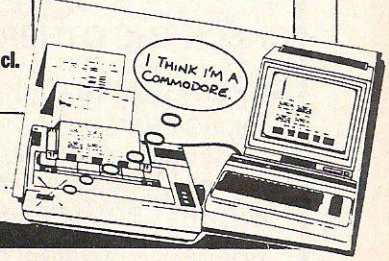
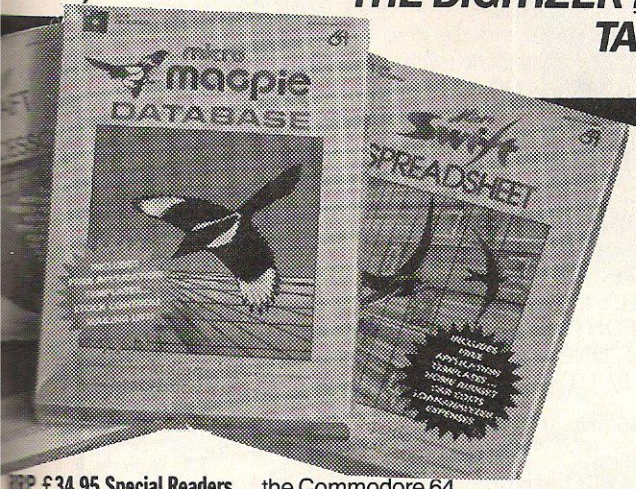


MAGIC!



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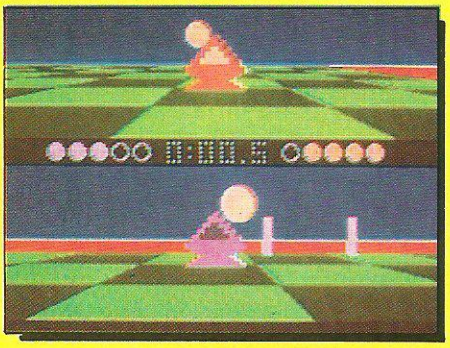


It was with pleasure that I accepted an invitation to go to Activision to see Ballblazer (the forthcoming release of which we announced in our October issue) and Koronis Rift – both Lucas film games.

Both are available for the 64, and Koronis Rift uses the same type of graphics first seen on Rescue on Fractulus.

BALLBLAZER

Ballblazer is a difficult game to describe. Basically it uses a split screen to show you and your opponent. Using the joystick you must beat your opponent to a ball and then, soccer like, score before he tackles you.

The game itself is not amazingly complicated, although it does take some time to be able to locate the ball efficiently. To add interest there are numerous options of play, ranging from a two minute game with you versus a low-level droid, to a 10 minute game against a friend.

Graphically the game is very nearly as good as the Atari original. Amazingly **smooth movement, completely flicker free four way scrolling, and some lovely colour effects** when a goal is scored all add up to an impressive show.

Musically, Ballblazer is also good, the bass on the intro theme having been a favourite computer-tune of mine since I heard the Atari version.

It is neither of these factors however, that make this game so outstanding on the 64. What does is the speed, addictiveness and the level of excitement it provides. Becoming involved in Ballblazer is very easy; having sat down for one quick game against the computer, you can find yourself playing for hours: and there are few games you can truly say that about.

In my opinion **Ballblazer is an essential for any games player's library,** and I can't recommend it higher than that! Finally I must thank Andrew Wright (grovel, grovel!), for being so lucid!

KORONIS RIFT

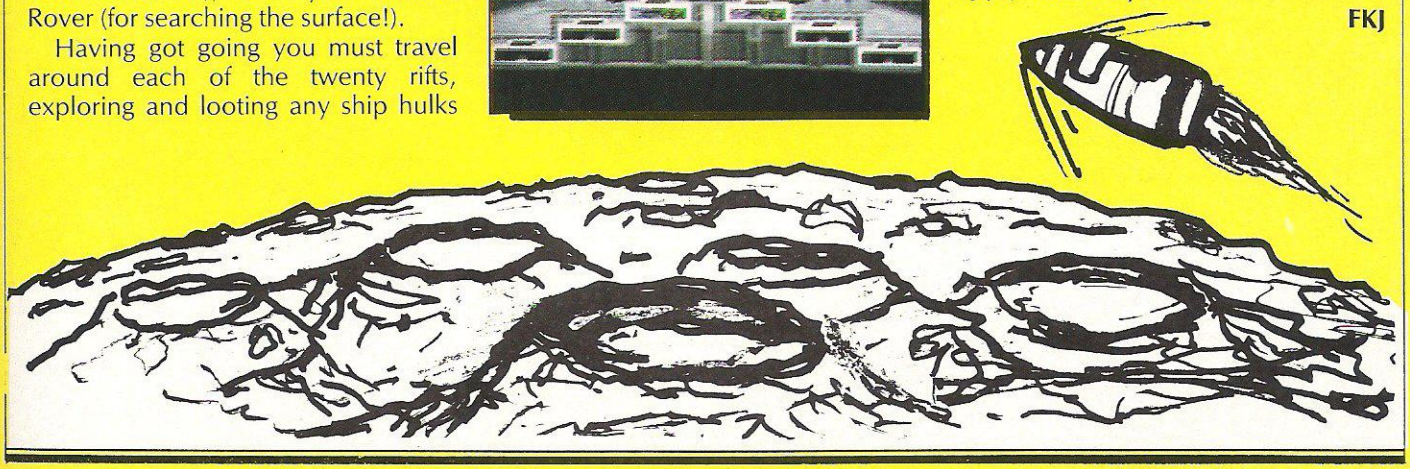
In many ways this game and Rescue on Fractulus are similar, although the scenarios are very different! Unlike Fractulus, the whole game does not depend on the quality of the Fractal graphics. As a game it is good enough that the graphics only serve to improve the general effect.

The story behind the game is as follows: you are a 'technoscavenger', travelling from planet to planet stealing anything of value either for your ship or, more commonly, for sale. On your latest flight you have discovered the legendary planet – Koronis Rift. You have landed on it and are travelling around either in your Scoutcraft (flying from rift to rift), or in your Surface Rover (for searching the surface!).

Having got going you must travel around each of the twenty rifts, exploring and looting any ship hulks you may find. The graphics are excellent all round – the Fractal graphics, this time in grey, give **a genuine feeling of movement,** and the robot inside your spacecraft is excellently defined. At the top of your craft you have five monitors, three of which have purposes, but there are also two left vacant for you to install what you want.

Overall the game may sound easy (oh yeah! Ed.), but to make sure no one finishes it quickly there is also a large amount of Guardian Ships which must be killed before you can continue! **Suffice to say that in America Koronis Rift is distributed by Epyx, need I say more?**

FKJ



The Divi

Everyone needs a joystick. A sweeping statement indeed, but with the Commodore 64 I think it can be said without fear of contradiction. This guide attempts to show some, not all, of the newest joysticks readily available in England. More joystick reviews will follow in later editions, but this ought to keep you going for the next month or so. Maybe it will give you some help deciding on a Christmas present?

QUICKSHOT II.

Undoubtedly the most popular joystick in the world, having sold many millions everywhere from America to Australia, the Quickshot two is cheap, strong and has proved very reliable after prolonged use.

It has two fire buttons-both handle mounted-one in the familiar trigger position, and one on top. The grip has a solid and comfortable feel, and the finger indentations are suitable for people of all ages.

The fire buttons have a switch mechanism meaning you can feel each time you have fired – something I find essential to good game play. On the gimmick side, it has the now usual auto-fire option, something I rarely find use for; but the suction cup base is efficient and useful.

My only real criticism is of the size of the base. If you do not have a flat smooth table, or your hands are not enormous, you will have difficulty using the Quickshot comfortably.

Price: £11.95
Features: ★★★
Precision: ★★★
Value for money: ★★★★
Contact: Spectravideo Ltd, 165 Garth Road, Morden, Surrey, SM4 4LH, Tel: 330 0101.

CHEETAH 125

This, the newest joystick from Cheetah, has all the features that should make it a big winner, but unfortunately it seems to lack something to make it complete.

It has a nice feel and the movement of the ball and socket joint base seems smooth and accurate. For someone who doesn't prefer using one hand to another, the Cheetah stick has fire buttons literally everywhere! As well as buttons on the handle and top, there are right and left hand buttons on the base meaning almost everybody will be happy with at least one of them!

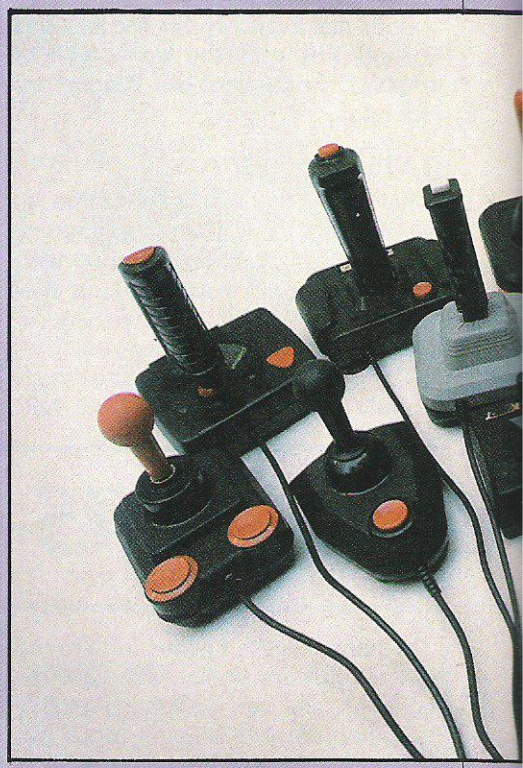
The big problem seems to be in the overall manufacturing quality. Cheetah who import these products, are not responsible, but the handle especially seems fragile, and the top two fire buttons seem to interfer with each other. This is a pity as otherwise it's a nice looking joystick.

Price:
Features: ★★★
Precision: ★★
Value for money: ★★
Contact: Cheetah Marketing.

EUROMAX ARCADE

Priced at £15.95, this is not an amazingly cheap joystick. It does not have auto-fire, and it looks – to say the least – drab. However this does not detract from the fact that it is a bloody good joystick.

The fire button is placed equally well for left or right handers. It is compact enough to be easily held in one hand if you don't have any desk space (and you should know! Ed), and manages to avoid giving you dreadful blisters when playing games such as 'Hypersports'; and that's a recommendation!



EUROMAX COMP PRO

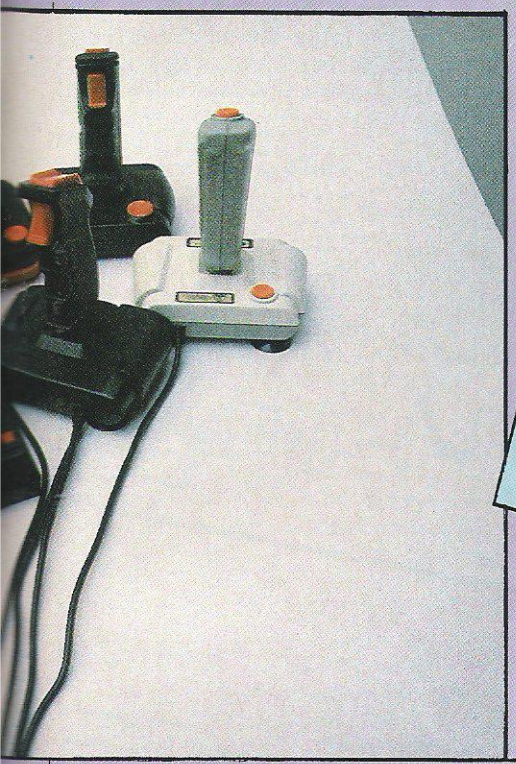
Made by the same people responsible for the Euromax Arcade, the Comp Pro is a more complete stick, for only one pound more.

The actual stick part is identical, as is the handle and the mechanism, but the fire, buttons of which there are two on the Pro are larger and easier to use. I can't really say a lot more as this joystick is otherwise almost identical to its cheaper brother.

The stars apply to both joysticks:

Price: Arcade £15.95
Pro £16.95
Features: ★★★
Precision: ★★★★
Value for money: ★★★★
Contact: Euromax Electronics Ltd, Pinfold Lane, Bridlington, North Humberside YO16 5XR. Tel: 0262 601006.

Joy sion



KRAFT

Vulcan's Kraft joystick doesn't really fit very well into this review – unlike the others, I would not recommend this for games use, unless you have nothing else. It has one feature which is unusual, and it is this which shows where the Kraft excels.

On the bottom of the joystick is a switch which allows you to choose whether you want a four or eight way joystick. It is this feature which makes this joystick so good for serious home or professional use. It is a small stick, roughly half the overall dimensions of the others, and fits neatly into the hand. The fire button is small but totally adequate, and the actual handle is neat and accurate.

I found this to be a practical and excellent joystick. If you use programs which require perfect lines and specific angles, then I can see no better joystick currently around than this.

Price: £12.95
Features: ★★★
Precision: ★★★★★
Value for money: ★★★
Contact: Vulcan Electronics Ltd, 200 Brent Street, Hendon, London NW4 1BH, Tel: 01-203 6366.

GUNSHOT I & II

Although these two joysticks look the same, they cost different sums – mainly due to the fact that one has an auto-fire switch, and one doesn't! One is also white (well, off cream! Ed), where the other is the more normal black.

Both seem to owe a lot to the design of the original range of Quickshot products, although the handle design is noticeably different.

If you decide that you need a quick-fire option, then you must have the Gunshot II, otherwise – in most cases – the Gunshot I will prove to be satisfactory, and good value for money.

Price: 1:£7.95 2:£9.95
Features: ★★★
Precision: ★★★
Value for money: ★★★★
Contact: Vulcan Electronics, 200 Brent Street, Hendon, London NW4 1BH. Tel: 01-203 6366.

CHAMPION

Not my favourite, it appeared at first to be very good. Neatly made and with the excellent option of being able to change the suction cups on the base to the more usual, and in my view better, non-slip rubber pads.

It goes down hill from there. The handle feels OK to start with, but after 10-15 minutes hard play, it begins to give you blisters and means playing again is uncomfortable.

The fire button on the top of the handle is insensitive, and the one on the base is not indusive to clean and accurate fire. It does have an auto-fire option, but this does little to reprieve this joystick.

Price: £7.95
Features: ★★
Precision: ★★
Value for money: ★★
Contact: C.G.L., C.G.L. House, Goldings Hill, Loughton, Essex IG10 2RR. Tel: 01-508 5600.

WICO BAT HANDLE

This is much more like it! Although relatively expensive, this joystick feels and reacts as well as anything I have used. It has two fire buttons, both positioned easily within reach for the right or left hander, although (a little surprisingly perhaps) you have to choose which button you wish to use.

In comparison with the other joysticks in this feature, the Bat Handle looks and feels much more like a professional product. It feels as good and as strong as many of the latter day arcade machines' sticks.

If you want a joystick that is as happy designing graphics on a computer aided design program as playing all the latest games, and have this amount of money to spend, then this could be the one for you.

Price: £27.99
Features: ★★★
Precision: ★★★★
Value for money: ★★★
Contact: C.G.L., C.G.L. House, Goldings Hill, Loughton, Essex IG10 2RR. Tel: 01-508 5600.

THE BOSS

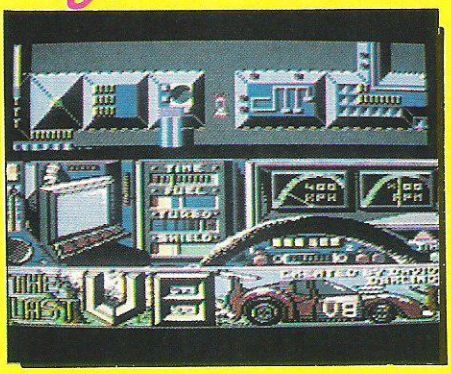
Not the name I would have chosen for this joystick, as amongst all the Sticks in this review, this is the most dated and least comfortable to use. It has the feel you would expect to find on a six-year-old Space Invaders machine – loose, inaccurate and unresponsive.

The fire is particularly bad, as it gives you no indication as to whether or not it has been depressed. C.G.L. are a large company, and I was surprised with this product, especially when compared with the excellent – if expensive – Bat Handle.

Unless you are particularly bored with your current joystick, or have tried this one and decided it is for you, then I'd recommend you go for another one.

Price:
Features: ★
Precision: ★
Value for money: ★
Contact: C.G.L., C.G.L. House, Goldings Hill, Loughton, Essex IG10 2RR. Tel: 01-508 5600.

THE LAST V8



Mad, or Mastertronics Added Dimension, is the latest selling phrase from a company known more for price than product. Looking at the game and its packaging, however, it became much more obvious why they have called it MAD!

The game places you as the driver of the last V8 left on a planet devastated by radiation after a nuclear war. You have been given permission to travel on the surface of the earth to try and 'make contact with the remnants of mankind'. Unfortunately, a delayed nuclear bomb has decided that it will explode in 20 seconds, and so you must get yourself and the last V8 to the relative safety of the underground intercity.

Even then however your problems have only just started! You must then travel carefully, but quickly, through the intercity. To successfully navigate this section you must not only be fast, but note the on-screen indications. Both sections require a lot of practice, a fact all at Mastertronic will vouch for! (Eh?)

The graphics on V8 are really outstanding, the top half of the split screen showing your car in the centre of a smooth four way scrolling play area. Lower down on the screen you have various status indicators; a rev counter, turbo gauge, countdown timer and a really neat monitor to give you clues throughout the second stage.

Throughout the game the attention to detail is outstanding, the shading in particular is excellent in the underground section.

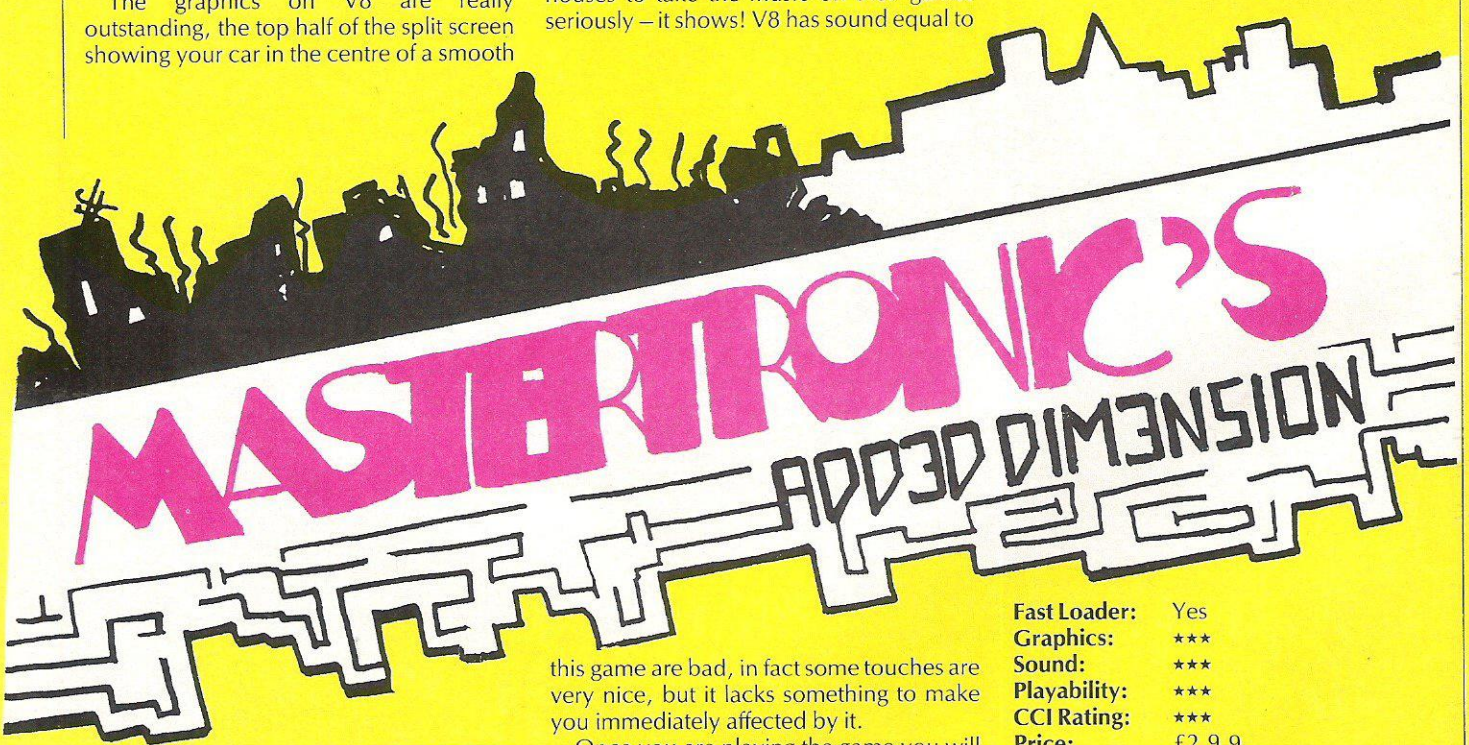
This year has seen a massive improvement in music for games, and Mastertronic were one of the first software houses to take the music on their games seriously – it shows! V8 has sound equal to almost anything I've heard. For however long I could make the game last (not very long to start with!) the music was one of the most impressive things.

As well as the great music, there are some impressive sound effects, and at the beginning of the first two levels there is some clear speech (but I think he needs something for his throat!).

It would be very difficult to think of many criticisms of this game were it priced at ten pounds, at £2.99 however it is virtually impossible. Perhaps the actual concept is not 100% original, but the implementation is still excellent.

Mastertronic games used to be excellent games because they were cheap – if the new MAD range are all as good as V8 then Mastertronic games will sweep the boards.

Fast Loader: Not Very
Graphics: ★★★★
Sound: ★★★★★
Playability: ★★★★
CCI Rating: ★★★★★
Price: £2.99
Contact: Mastertronic, 8-10 Paul Street, London EC2A 4JH. Tel: 01-377 6880



HERO OF THE GOLDEN TALISMAN

Another of Mastertronics MAD range of games released for Christmas is Hero of the Golden Talisman. Using the tried and trusted maze as a base for the game they have managed to release a game of not bad value – especially at £2.99.

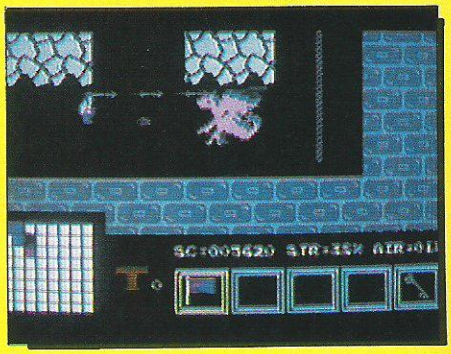
The real problem with this game was created not by anyone else, but by Mastertronic themselves. By releasing this game along side The last V8 (see mega reviews) they have showed what can be done, thus devaluing Talisman.

Neither the graphics nor the sound of this game are bad, in fact some touches are very nice, but it lacks something to make you immediately affected by it.

Once you are playing the game you will realise that it is really quite playable, if on a somewhat predictable level. The character is nicely animated, although his swimming leaves a little to be desired, and the maze is certainly large enough with roughly 256 rooms to be searched. The puzzles are not difficult, but missing one jump can mean ten minutes retracing your steps, and that can be really frustrating!

Considering people cannot seriously be expected to spend £10 every time they quite fancy a game, Mastertronic have approached the market very sensibly, but with V8 they have shown what can be done, and this is not as good, unfortunately.

Fast Loader: Yes
Graphics: ★★★
Sound: ★★★
Playability: ★★★
CCI Rating: ★★★
Price: £2.9 9
Contact: Mastertronic, 8-10 Paul Street, London EC2A 4JH. Tel: 01-377 6880.

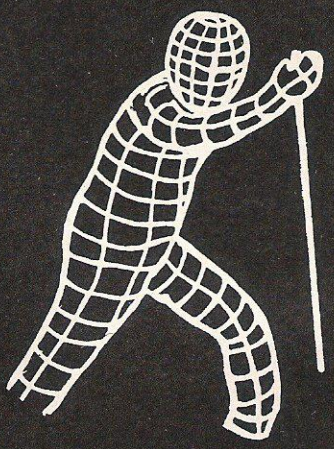


In addition to our regular comprehensive Commodore peripherals guides, we are publishing monthly add-on updates to keep you in the picture.

Peripheral Update

Product	Features	Commodore Machine	Price	Guarantee	Company
INTERFACES					
Parallel Interface	Compatible with existing software; plugs in direct; device number can be altered; 16k printer buffer option	64,VIC,C16	£44.95	12 months	Zero Electronics Tel: 0493 842023
Super Graphix	8K buffer; 10 printing modes re-set button; internal fonts	64/128	£49.95	12 months	Screens Tel: 09274 20664
MONITORS					
1431 AP	14", standard resolution, low complexity colour display, high quality colour resolution	64	£259		Microvitec Tel: 0274 390011
2030 AP	20", standard or high resolution	64	£465		Microvitec Tel: 0274 390011
CM 31481 VI	80-column text display, green or amber text switch	64,128 VIC	£270		Thomson Tel:01-631 3434
VM 3102 VG	Flat-face monitor with green text (amber text-VM3102VA)	64,128 VIC	£85		Thomson
CM 36632 V	40-column text display, built in speaker	64,VIC	£189		Thomson
MUSIC ADD-ONS					
MCS	Combines interface, MIDI link and comprehensive disk software	64	£200		Joreth Music Tel: 0386 831615
AMS	Editor, keyboard, linker synthesiser and MIDI modules	64/128	£39.95	12 months	Rainbird Tel: 01-379 6755
MICE					
MS 2000	Optical encoding and a comprehensive cassette-based software	64/128	£69	12 months	Wigmore House Tel: 01-734 0170

Win Top US Gold Games



Winter Games has been enthusiastically received (see mega review in this issue) by all. CCI is very pleased to be able to offer a copy of this excellent game to 10 lucky winners.

And if that's not enough to tempt you to enter, the 10 winners will ALSO receive a copy of Desert Fox and Fight Night (see review) – both from US Gold.

This attractive package of games will test not only the strength of your joystick, but your powers of logic as well.

All you have to do is answer three simple questions on the subject of winter games.

Answer the following questions:

1 How often are the Winter Olympics held?

A _____

2 How many different sports are represented in the Winter Olympics?

A _____

3 Where were the last Winter Olympics held?

A _____

For those of you who couldn't find a white pencil in order to complete last month's competition page (WHOOPS!!), here's another chance to win!

Win Topper The Copper

Topper the Copper, from English Software, puts you in the role of detective with a homicide to solve. Was it Dr Mustard Poison or Prof Brown Noose? Collect eight clues hidden around Mad Marvin's caverns and the mystery will be solved.

If you can answer the following questions, you can win yourself the opportunity of solving the murder with one of the 50 free copies of Topper The Copper we are giving away.

Answer the following questions:

1 What was the name by which the forerunners to the police were known?

A _____

2 What man was responsible for the founding of the above force?

A _____

3 Who is the current Police Commissioner?

A _____

All entries must be received by 9 December 1985. Feel free to send a photocopy of the page if you don't want to cut the magazine up.

The winners will be the first correct entries drawn out of our competition sack.

Send your entries to:
Software Competitions,
CCI,
40 Bowling Green Lane,
London EC1R ONE

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Address .....

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WAY OF EXPLODING FIST	9.95	7.50

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THEATRE EUROPE	9.95	7.50
BRIAN JACKS SUPERSTARS	**7.95**	**4.99**
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CCI PRIZE WINNERS!!!

Disk Competitions

C128 and 1570
The winner of our star prize of the Commodore 128 and the 1570 disk drive (unfortunately the 1571 has been delayed) is Stuart James of Beccles, Suffolk. Congratulations Stuart!

1541 disk drives
Five other readers have won themselves Commodore's 1541 disk drive. They are as follows:

Mr H A Clarke of Weybridge, Surrey; W M Chua of North London; T Delbaere of Aylesham, Kent; Cameron Gilchrist of Fife, Scotland; and J Dick of Chapel-en-le-Frith, Cheshire.

Sampler Competition

We asked you to think of a spoof version of Paul Hardcastle's 19. Apart from the hundreds of '64 by the Commodore's' entries (not too original I'm afraid folks!) we were inundated by witty entries.

It was a hard choice, but the winners are as follows:

Commodore Sampler
The winner of our first prize is Chris Cotton of Daventry, Northants with his entry '101010 by Count Binary and the Duo Digits'.

Sound Studio
A Sound Studio each go to Michael Partington of Shevington, Lancs (9 by Adolf Hitler) and Karen Rolph of Heaton, Tyne and Wear (7 by Liz Taylor and the Grooms).

Bruce Springsteen
Ten copies of Peter Gambaccini's new book Bruce Springsteen go to our runner-up:

Joanne Denny of Cheadle, Cheshire; Mark Bonnici of Leigh-on-Sea, Essex; Mrs M Caine of Formby, Liverpool; Mr N Shevill of Coulsdon, Surrey; Jaap Brunner of Gorkum, Holland; T J Whelan of Godalming, Surrey; Julien Francois of East London; Gary Wickham of Epsom, Surrey; Mr C J Durham of Blandford Forum, Dorset; and Phill Campbell of Torry, Aberdeen.

Peripheral Competitions

Three lucky readers will shortly be receiving their prizes for correctly answering the questions in our peripherals competition.

The Stick
Ernosto Hess of North London will soon be surpassing previous efforts at sport and simulation games.

Datex Mouse
I Davies of Aigburth, Liverpool wins this graphics mouse.

Datapen
William Hughes of Abercrave, Swansea will be busy drawing with his new lightpen.

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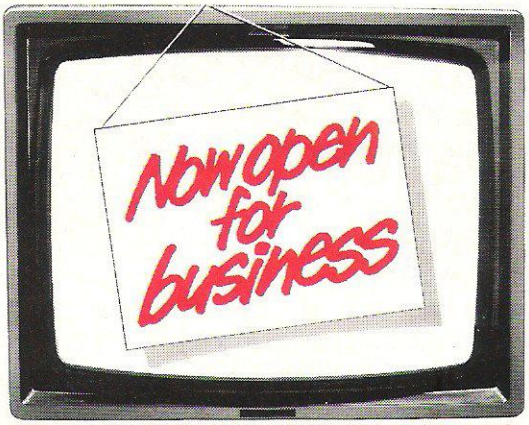
The computer that's been giving you such a fun time with games now gives you the chance to earn some money. Helping you with word processing, secretarial work and even running your own business.
All because of the brilliant new word processing package, SuperScript from MicroPro — the makers of WordStar — the world's best selling word processing packages for microcomputers.



SuperScript **writes letters, invoices, reports, tables, documents, it stores, edits and even checks spelling.**

Versatile SuperScript SuperScript combines word processor, spelling checker, calculator and mail-merge facility, all in one package. So SuperScript gives you all the tools you need to produce high quality reports, tables, lists, personalised letters and prints labels quickly and efficiently.

Simple for the beginner If you are a newcomer to word processing, SuperScript puts you immediately at ease.
Each command is a single word, and for each command you simply move the cursor. You don't even have to type the command.

Good with numbers SuperScript allows you to extend your editing line up to 250 columns for wide documents like financial statements, and with decimal tabs it's easy to enter properly justified tables of numbers.
SuperScript's complete set of calculator functions can be used interactively or you can operate on numbers from the text of your document. Apart from the usual mathematical functions like add, subtract, multiply, divide, and percentages, you have the ability to add rows, columns or even whole tables.

Good with spelling, too The built-in spelling checker goes right through your text, checking for errors. You have the option to correct any error, ignore it, or add the word to its 30,000 word dictionary.

Editing options SuperScript gives you all the editing options of a business-style word processor, with full block manipulation for cut-and-paste; overtype or text insertion modes; search and replace with pattern matching and optional case discrimination; backward search, case shifts for single words or larger blocks of text. And much more.

Powerful for the experienced user SuperScript also gives you the ability to cut work down to a minimum by storing your own command sequences or text on single keys. This means that with a single keystroke you can reproduce commonly used phrases or multi-line addresses from a glossary, load in document formats or execute a pre-programmed sequence of operations.

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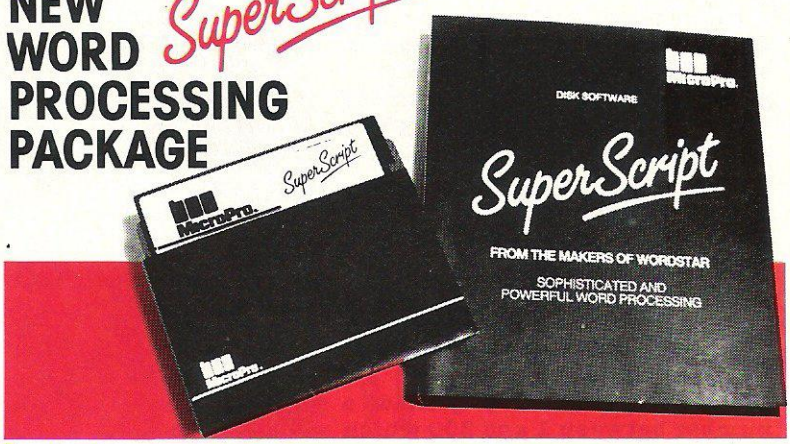

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CCI is giving you the chance to win literally hundreds of games while at the same time helping the computer industry's pet charity, Soft Aid!

Win an Incredible £5000 of software!!!

Each month we are sent all of the latest and greatest games for review purposes. It's almost got to the stage where we can hardly see our computers for the mound of software. So we have decided to put it to better use. We are giving Great Ormond Street Hospital for Children one hundred games, along with a 64 and cassette recorder. And you can help us to raise money for Soft Aid, the computer industry's fund for Ethiopia.

We have set a 50p entry charge for our amazing competition in which you can win hundreds of games. You can enter as many times as you like, but each entry must be accompanied by 50p.

Oskar competition

In this issue CCI have awarded Oskars for the best products of 1985. We want you to tell us if you agree with our decisions and if not to tell us your choice and the reasons for it.

Secondly, we have picked a number between 1 and 200 which you must guess.

The Prizes

1st Prize: 500 assorted games
2nd Prize: 200 assorted games
3rd Prize: 100 assorted games

Prizes will be awarded to those who correctly guess our chosen number (or come closest to it) and who provide the most convincing reasons for their choice of Oskar winners.

The closing date for this competition is January 6, 1986. All entries should be sent to:
Oskar Competition
CCI
40 Bowling Green Lane
London EC1R ONE
Don't forget the 50p entry charge. The Editor's decision is final.

Please indicate whether you agree with our decision. If not, tell us (in less than 20 words) your choice and your reasons for your decision.

OUR CHOICE	AGREE (please tick)	DISAGREE (please tick)	YOUR CHOICE
GAME OF THE YEAR Summer Games II			
64 ARCADE OF THE YEAR Batalyx			
64 ARCADE/ ADVENTURE OF THE YEAR Frankie Goe To Hollywood			
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64 SIMULATION OF THE YEAR Elite			
C16 ARCADE OF THE YEAR Berks			
C16 SIMULATION OF THE YEAR Formula 1			
GAME SOUNDTRACK OF THE YEAR Monty on the Run			
BEST GRAPHICS IN A GAME DURING 1985 Summer Games II			

I think that the number between 1 and 200 which CCI have chosen is .....
Name .....
Address .....
.....
I enclose my 50p entry fee which will be donated to Soft Aid
Cheque ☐ Postal Order ☐ Access ☐
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Win a Thomson Monitor!!

Thomson has a brand new range of monitors and is providing two 14" colour monitors compatible with the 64 and 128 as prizes!

It's a prize well-worth winning and we're not making it too easy for you. To win you must correctly answer two questions. They do look difficult at first sight, but if you sit down and think you should come up with the answers. (Then you'll groan at how easy it is really!)

The closing date for this competition is 6 January 1986. Send your entries to:

Monitor Competition
CCI
40 Bowling Green Lane
London EC1R ONE

Name: .....
Address: .....
.....

The Questions

1. These unfamiliar sequences should nevertheless ring a bell.
What is their basis?
3, 8, 15, 12, 7
and
1, 6, 15, 14, 9.

---

2. Transcribe the cryptogram for visual relief; and then reflect on it.
SY*R SRFT GSAS OIO* EUMC NSOT
*EEE O*O* HI** RTNM RTPO *OMH

---

3. In the event of a tie, the winner will be drawn at random from all the correct entries.

Win Essential Books!!

The Naked Computer has been awarded the CCI Oskar for Best Book of the Year. We've got two copies of this fascinating ante dote to the serious computer manual, to give away.

We're also giving away two copies of Richard Pawson's The Robot Book containing a wealth of interesting information about the world of robotics. (You may well have read our interview with Richard Pawson in our November issue.)

The Competition

All you have to do in order to win one of these books is to correctly answer these three easy robot-related questions.

The winners will be the first four correct entries pulled out of our competition sack. The closing date for this competition is 6 January 1986. If you do not wish to cut up the magazine, please send a photo-copy of the competition page.

The Questions

1 What was the full name of the computer in 2001?
A
2 Which film did the robot C3PO appear in?
A
3 What was the name of the first robot to appear in a film?
A

Name: .....
Address: .....
.....

Send your entries to:

Book Competition
CCI
40 Bowling Green Lane
London EC1R ONE

Win Sweatshirts !!

Be seen in the height of fashion this winter – the CCI Sweatshirt! We're giving 10 sweatshirts to the winners of this competition, PLUS 20 CCI T-Shirts and 10 of Jim Butterfield's Commodore Reference Diaries to our runners-up.

The Competition

We want to see how many words you can make out of the name 'Commodore Computing International'. All words must be found in the Oxford English Dictionary and can only use the available number of letters. Eg, no word can feature the letter 'C' more than twice.

We also have a tie-breaker for you to complete in under 20 words in the event of a draw.

The closing date is 6 January 1986 and entries should be sent to:

Sweatshirt Competition
CCI
40 Bowling Green Lane
London EC1R ONE

COMMODORE COMPUTING INTERNATIONAL

Please list the number of words you can make from this name on a separate piece of paper, attach it firmly to your competition entry and complete the following.

(insert number)

I made ..... words from Commodore Computing International.
"I know I Get The Best when I read CCI because"
.....
.....

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Address: .....
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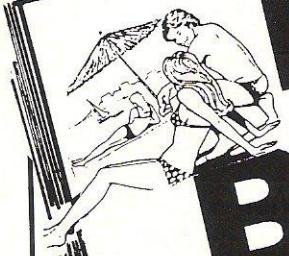

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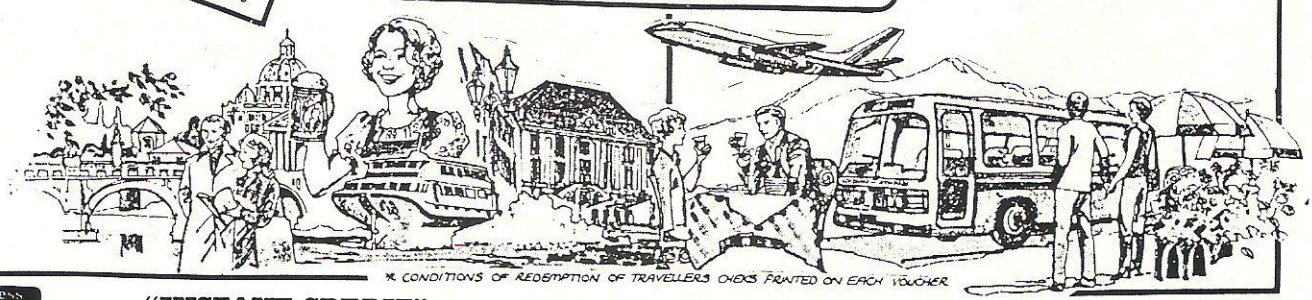

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COLOSSUS 4 CHESS

Colossus came out about 15 months ago as Colossus 2.0 and has now been updated to Colossus 4.0. The program has been written to try and meet many of the demands that a keen chess player would make on such a program, such as problems, blindfold chess etc as well as over the board playing.

Display

Colossus takes about two minutes to load from disk (a cassette version is available). When loaded, the board with excellent clear graphics for pieces is displayed in 2D with algebraic notation around the border. The improvements in Colossus 4.0 include the ability to alter some of the parameters such as whether or not to use the opening book, whether Colossus should 'think' in your time, the line depth displayed on the screen, whether the display should be in two dimensions or three and the balance at which you would like a draw. These parameters are accessed by keying Q. Immediately one sees Book?1 on the screen, this means that the default is 1, ie to include the opening book, but one can alter this to zero, by using the up-down cursor, which means that Colossus will play without it. Next comes prediction, ie whether Colossus should think in your time. Here the default is that it will think whilst you are working out your move. Line depth can be anything from one to 15 ply with a default of two ply. Line depth is the display of the current line that Colossus is thinking. This is in addition to the display of the best line it has found.

Unlike Colossus 2.0, which displays the move which it is considering to the right of the board, Colossus 4.0 displays this on the second screen but the move it last played is shown to the right of the board. The second screen is obtained by pressing the space bar. This screen shows: the elapsed times for both sides; the last seven moves played; the best line it has found so far with the Colossus advantage/disadvantage which is divided into material and positional; the current line it is thinking about; how many ply ahead Colossus is looking; the number of positions evaluated and your assumed move when it is thinking in your time.

The material score is fairly simple to comprehend, ie a pawn down is represented by -1. However, the positional part of the score is not calculated in decimal of 'pawns' – a minus figure means that you have a positional advantage and a plus figure means that Colossus has the advantage. Exactly how one interprets the actual figure, eg 40 compared with 20, is debatable especially when a large material advantage is involved, eg when you mate your opponent the score gives you a large material advantage, ie 62, and a small figure for position!

In play

To enter the moves you have three options – the joystick, the cursor or the keyboard. Unlike the earlier version there is no need to SHIFT the letters of the algebraic notation. All methods are clearly explained in the manual. If the move involves promoting a pawn, Colossus will ask 'Promotion piece?' and you have to tell it what piece you would like. If Colossus is promoting a piece then it will decide what piece it requires. Colossus is familiar with the 3-fold rule, 50–move rule and Stalemate as well as with Checkmate. You can also set the 'draw score' with the latest version. The draw score, like the ordinary score, is divided into material and position. The lower the draw score is set the more Colossus will try to win, the higher it is set the more the program will be happy to allow a draw, eg by repetition of position. Colossus is also capable of playing itself and of replaying a game which you have already played. When replaying a game you can set the pause interval between moves from 0 to 20 seconds. Even if you have keyed N for a new game you can still replay the previous game providing you have not made a move. Also if you press the commodore key whilst the program is replaying and do not make a move you can still replay the whole game not just up to the point where you interrupted the replaying. Another feature which has been added is to show all the legal moves that a given piece may make. It will only do this facility when it is your turn to move.

Modes or types of play

In the earlier version of Colossus one had to key M to alter the mode of play, this has been altered to T in the latest version and the major only change is the ability to work out help-mates in problem mode. In fact Colossus is the only program which is capable of solving self-mates and help-mates. I do not even know of a dedicated chess computer which can do this! The level of difficulty at which Colossus will play is determined by the time allowed per move or per game. The First mode lets you play 'Tournament style' as it demands that X moves to be played in time Y followed by a secondary parameter of A moves in time B. The Average Mode asks the time per move. This can be anything from 1 second a move to 59 mins 59 seconds a move, so this mode is useful in lightning chess (ie 10 seconds a move) and for analysis if you do not want to use the infinite mode. Mode 3 needs the time for the total game, useful for playing five-minute chess. It is only in this mode that one can win or lose on time. Mode 4 makes Colossus play at the same rate as you – if you take a long while so does Colossus, if you take a few seconds then it does so as well. Then there is the infinite mode which means Colossus will continue to look until you interrupt it, it finds a mate, or it has searched 14 ply (half-moves) ahead. Lastly there is problem mode which has three sub-divisions. One sub-division will find normal mates in up to seven moves, the second sub-division will find help-mates and the last sub-division will find self-mates. Once a mate has been found it will ask you if you wish to search for an alternative mate and if you press y the program will look for an alternative but will NOT restart the clocks which is contrary to the manual.

Operation

If desired you can change the colour of the white squares (called ink colour by Colossus), the colour of the rest of the Colossus display (called paper colour) and the colour of the border surrounding Colossus display. During the course of a game you can step backwards and forwards which is useful if you make a mistake or if yo want to play a different line

COLOSSUS 4 CHESS

and in addition the 'Alter Position' command will let you set up a particular position easily and if you make a mistake the original position can be recovered by pressing g. However, if you want to enter a few moves to set up an opening it may be easier to type S and then enter the moves for both sides.

Colossus can play against itself and as stated earlier you can replay the whole of any game at the speed. You can even set the elapsed times for each side and if you want to play a friend then Colossus will supervise to make sure you do not cheat! This is also useful if you want to run through the moves to get to a certain position.

Blindfold chess was mentioned earlier in which you can make the pieces invisible. In fact you have three options a) make the white pieces invisible, b) make the black pieces invisible, c) make all pieces invisible. But do not worry, it is still there in effect so you can revert the situation!

You can even save the game to tape or disk which not only saves the current position but all the moves from move 1 to the current position as well (max 120!). One of the best amendments to the update is the ability to store up to 256 games per disk and as each game takes four blocks this limit should not pose too much of a problem! However, you have to allocate a name from file zero to file 255 so you will have to label your disks with a bit of detail. The minor snag is that when you save the position you do not save the line of best play which would be useful especially when you have had the machine running for hours! (It would also be nice if one could get a hardcopy of the moves of a game.) You can initialise a disk or load a previously saved file. A selection of master games and games played on chess computers/programs has been included in the latest version for you to replay as well as several help-mates and self-mates.

Another improvement has been an extension of the 'next best' facility. In Colossus 2.0 this facility only existed in Problem mode when it asked if you wanted to continue searching for an alternative mate. Now you can use U at any time during the game providing it is the computer's move. Whilst in the opening book it will only give alternatives which are in its opening library, once outside of the library it will find the next best move. This facility can be utilised as many times as you like in a position until 'NO MORE MOVES' is printed.

Conclusion

Colossus is a well designed program including many features, plus comprehensive opening theory, not seen on other home micros. It must be the best chess program available for C64 and at £9.95 on tape and £14.95 on disk, every chess player should have a copy. However, occasionally it does hang-up for no apparent reason but this is not often and one should not be discouraged from using it as it is simple to use, yet more fun, than any board and you can learn so much more with the attraction of playing games whenever you want and saving them as well.

Jennifer Goldsmith

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TASWORD 64 is a new member of the highly acclaimed TASWORD family of word processing programs. Eighty characters per line on the screen is just one of the features of this versatile program. TASWORD uses its own internal character set in which each character is half the width of the normal character size. (Perfectly readable on a monitor – on a colour T.V. the best results are obtained by tuning an unused channel to black and white). With an eighty character display you know that what you see is what you are going to get when you print your text.

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Device Number Conversion

A shortcoming of the 1520 printer plotter is that its device number is 6. Michael Tinker reveals how to switch between 6 and 4 – the device number utilised by most software.

The 1520 Printer/Plotter is an economical device which writes and draws with a quality which belies its price. One of its shortcomings however is that it s device number is '6'.

All proprietory serial printers for the Commodore range of computers use the device number '4' which, quite naturally, has lead to all the software to be specifically for device # 4 which has in most cases left out the 1520 owner.

The method described here will allow, quite simply, the device number to be switched at any time from #6 to #4 by the use of a small switch on the side, thus ensuring that there is complete compatibility with all of your software.

It must be pointed out that these modifications will invalidate the maker's warranty.

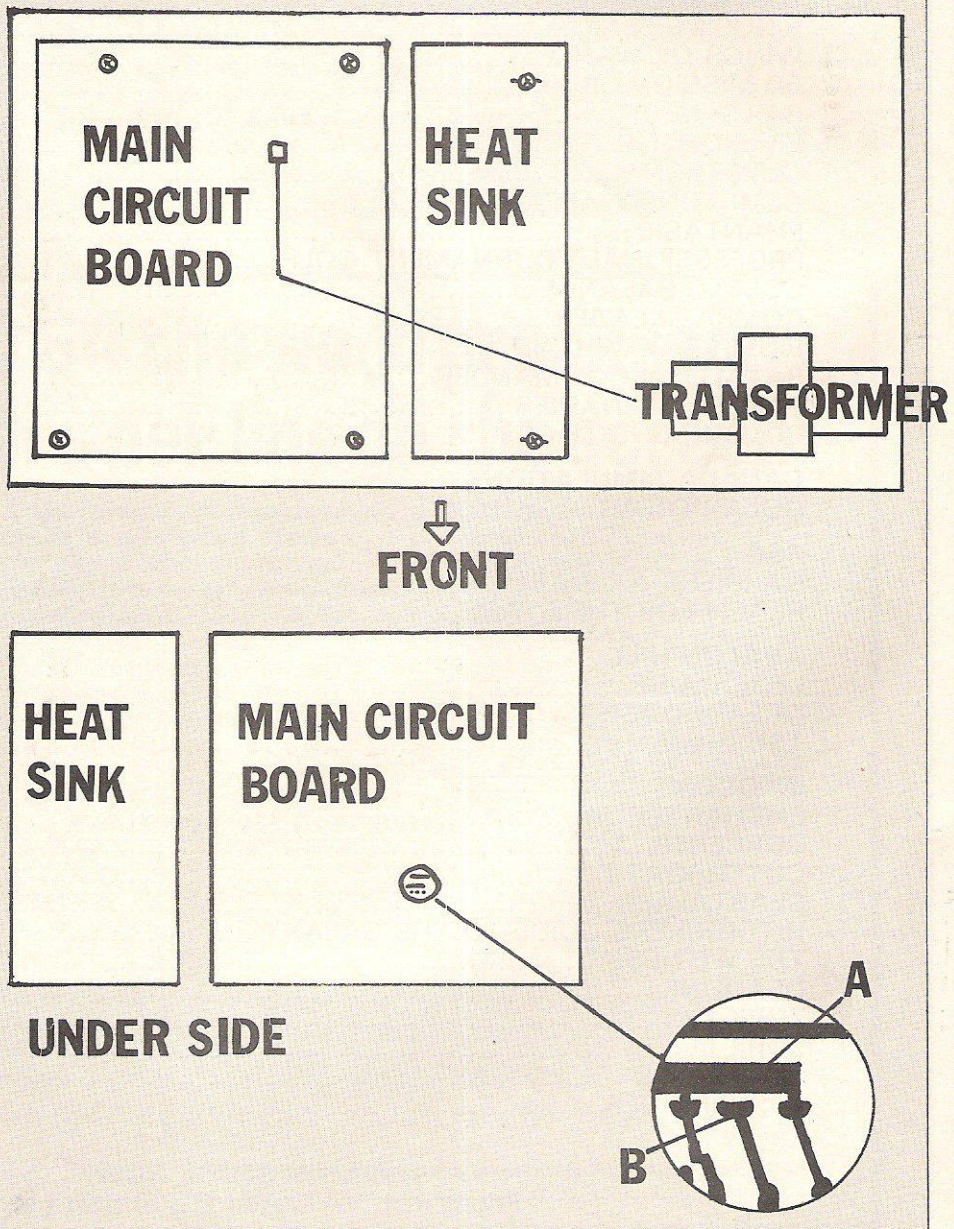
Equipment

One sub-miniature single pole change over toggle switch.
Two pieces of fine wire approx 6" long.
One soldering iron.
One small Phillips screwdriver.
One small drill.

Instructions

1. Disconnect all leads, especially the mains lead.
2. Remove two screws under the front of the plotter.
3. Turn the plotter the correct way up, lift front of casing then pull gently towards you – the top will then come off. Take care as there are wires connecting the base to the top.
4. Disconnect the two blue wires from the circuit board.
5. Remove the four screws from the corners of the main circuit board.
6. Remove the two screws that hold the metal heat sink in place (not the ones that hold the two voltage regulators!).
7. Clean the green varnish off the centre 'D' shaped piece of circuit board (marked B on the diagram) and solder one lead to it.
8. Solder the second lead to the copper track opposite (marked A on the diagram).
9. Drill a hole in the case at the lefthand rear, big enough for the switch and fit the switch.
10. Connect the lead from B to the centre terminal on the switch. Connect the other lead to the uppermost terminal (if the top were fitted).
11. Refit the circuit board in reverse order.
12. Refit the blue wires to the circuit board.
13. Refit the top and carry out a test to ensure that the printer operates as both device #6 and device #4.

The 1540 can also be changed to device #4 by just soldering a small piece of wire from A to B. This means, however, that the 1540 will have to remain as device #4 in normal use but can be changed at a later date.



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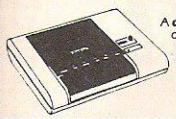

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THE NEW GENERATION OF BACKUP METHODS HAS ARRIVED

"Freeze Frame" is the product that '64 owners have been waiting for. At the flick of a switch **"Freeze Frame"** will take control of your computer and freeze the program in memory, allowing you to **SAVE it to tape or disc**. The uses are endless, but typical applications are . . .

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In fact **"Freeze Frame" will FREEZE any program** that is memory resident, and allow you to make a back up of that program onto tape or disc. The beauty being that the saved version can be a fast booting single file. The process is **completely automatic**, no knowledge of BASIC or machine language is required, just follow the prompts and the simple instructions for **100% success**.

"Freeze Frame" is a hardware "device" that plugs into the cartridge port of the '64. It does **NOT** dump the entire contents of memory, just the **working program**. Programs converted run **independently** of the hardware.

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WARNING: Don't be mislead by other adverts, if you want to transfer turbo load programs to disc, software only utilities are **inadequate**. They suffer from a variety of drawbacks including poor success rate, awkward to use, greedy on disc space and overpricing.

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IS YOUR 1541 HEALTHY?
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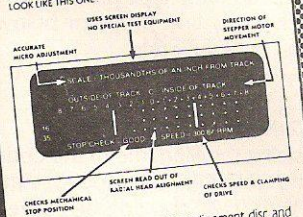

The program includes a digital alignment disc and software which allows you to **accurately check and correct** disc drive alignment. The instruction booklet is **very detailed**. Also includes quiet drive stops to **stop** that "hammering" thus preventing further problems.

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This is the first copier of its kind to appear on the U.K. market. It is a **true nibbler** (byte for byte) copier that will copy **ALL DOS errors automatically**. This includes DOS errors 20–29 inc. plus non standard errors like half tracks, extra tracks, non standard sync. renumbered tracks, etc. They are all treated as normal work. No knowledge is required at all it just **"nibbles away"** and produces a perfect copy. Yet it **only takes eight minutes**. Has copied **all discs tested** (except itself). A **class above** anything else available.

Fast File Copier
An **incredibly handy** selective file copier that LOADs and SAVEs at **five times** normal speed. Sounds useful? You won't believe how much until you have used it.

As well as these programs "Disc Disector" incorporates a whole host of useful utilities including the following. **Fast Format**, **Selective Menu Maker**, **Disc Editor** (new sophisticated machine code version), **Scratch/Unscratch**, **Fastcopy**, **Rename**, **Fastload** (four times faster), etc. etc.
This program is an **essential purchase** for the 1541 user.
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Customers with earlier versions may return them along with £9.95 for "V3.0".

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128

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Basic Utility: Keyword System

Peter Lager has provided us with this useful 64 utility for a keyword system. It also has an additional plus for disk drive owners. Read on!

Described here is a valuable utility for the BASIC Programmer. Pressing the CNTL, C= or SHIFT key together with a letter will give you any one of the BASIC2 keywords. An additional plus for 1541 disk drive owners is disk directory and disk errors direct to the screen without affecting any BASIC program in memory.

The program is located in high RAM from 49152 ($C000) to 51712 ($CA00) inclusive and is wedged into the interrupt routine. Also memory locations 679, 680 and 681 are used as flags and therefore should not be altered.

The BASIC loader is in two Parts:
PART 1 lines 1000 to 1370 store the keywords.
PART 2 lines 2000 to 2380 stores the machine code.

The table provides a list of keywords in alphabetical order together with the appropriate keypress to get them.

The program operates in one of two states.
(1) Activated = keywords available, border colour is green.
(2) Deactivated = keywords unavailable, graphic characters available, border is blue.

In the activated state graphic characters can be entered between quotes, as in PRINT statements and string assignments. This is possible because the program makes a note everytime you press the quote (SHIFT 2) key. It is recommended that when using the screen editor that you do it in the deactivated state, so that keywords don't appear when you want a graphics character.

The function keys do the following actions:
F1 = activate keyword system.
F3 = deactivate keyword system until F1 is pressed.
F5 = test program state. Set border to appropriate colour.
F6 = display disk errors to screen.
F8 = display disc directory to screen.

The program is initially activated with SYS 49567 and this is also necessary after RUN STOP/RESTORE. The command SYS 49589 will return the computer to the standard C64 interrupts.

It is possible to alter the keywords to anything you want with the following restrictions:
(1) The new word is not more than 7 characters long.
(2) If the new word has a comma then it must be enclosed in quotes to be identified as one word in the data statements.
(3) Certain keys are not recommended to be based with the CNTL key since the ASCII code generated has a special meaning. These keys are E H I M Q R S T.

The data in lines 1000 to 1250 are arranged for easy alteration. Each line has 6 data elements – they are:

1 = ASCII code for SHIFT + <letter>
2 = Keyword for SHIFT + <letter>
3 & 4 are the same but for the C= key
5 & 6 are the same for the CTRL key

The <letter> is A for line 1000, B for line 1010 up to Z for line 1250.

The codes for the disk error and disk directory are relocatable so they can be copied to anywhere in RAM to use in your own utilities.
DISK ERROR CODE = 49396 to 49428 incl.
DISK DIRECTORY CODE = 49280 to 49389 incl.

The first 5 bytes in each of these routines clear the screen so they can be omitted if not required.

It takes a while to get to know where all the keywords are but can save a lot of time typing once mastered. Rather than ruin this magazine, photocopy the table and stick it to a piece of card for easy reference.

To save time on loading the program the code can be saved off to tape or disk using a monitor. The two line program below can be used to load the code.

```
10 F=F+1:IFF=1 THENLOAD "WORD2",1,1
20 SYS49567:NEW
```

WORD2 being the filename of the code saved with the monitor. On tape systems the code WORD2 should be saved immediately after our short BASIC program. On disk systems the device number should be changed to 8.

```
0 REM  ************************
1 REM  ****    KEYWORD     ****
2 REM  **** BY PETER LAGER ****
3 REM  ************************
4 :
5 :
1000 DATA 193,ASC(,176,ABS(,1,ATN(
1010 DATA 194,CLR,191,CMD,2,CONT
1020 DATA 195,CHR$(,188,COS(,3,CLOSE
1030 DATA 196,DATA,172,DEF FN,4,DIM
1040 DATA 197,EXP(,177,END,5,
1050 DATA 198,FOR,187,FN,6,FRE(0)
1060 DATA 199,GOTO,165,GOSUB,7,GET
1070 DATA 200,READ,180,RESTORE,8,
1080 DATA 201,INPUT,162,INT(,9,
```

```
1090 DATA 202,RND(,181,REM,10,RUN
1100 DATA 203,LEFT$(,161,LEN(,11,LOG(
1110 DATA 204,LIST,182,LET,12,LOAD
1120 DATA 205,MID$(,167,POS(0),13,
1130 DATA 206,NEXT,170,NOT,14,NEW
1140 DATA 207,OPEN,185,ON,15,OR
1150 DATA 208,PRINT,175,POKE,16,PEEK(
1160 DATA 209,AND,171,,17,
1170 DATA 210,RIGHT$(,178,RETURN,18,
1180 DATA 211,STR$(,174,SYS,19,
1190 DATA 212,THEN,163,TAB(,20,
1200 DATA 213,USR(,184,IF,21,
1210 DATA 214,VAL(,190,,22,VERIFY
1220 DATA 215,WAIT,179,,23,SAVE
1230 DATA 216,SPC(,189,STOP,24,STEP
1240 DATA 217,TO,183,TI,25,TI$
1250 DATA 218,SGN(,173,SIN(,26,SQR(,9999
1260 :
1270 REM **************************
1280 REM    SETTING UP KEYWORDS
1290 REM **************************
1300 :
1310 PRINT"■■■ CLEARING MEMORY":FORI=49664TO51712:POKEI,0:NEXTI
1320 PRINT"■■ STORING KEYWORDS"
1330 FORI=1TO3*26:READQ,Q$
1340 J=LEN(Q$):IFJ=0THEN 1360
1350 FORK=1TOJ:POKE49663+8*Q+K,ASC(MID$(Q$,K,1)):NEXTK
1360 NEXTI
1370 READQ:IFQ<>9999THENPRINT"■ERROR IN KEYWORD DATA":END
1380 :
1390 :
1400 :
2000 DATA 32,234,255,165,204,208,41,198,205,208,37,169,20,133,205,164
2010 DATA 211,70,207,174,135,2,177,209,176,17,230,207,133,206,32,36
2020 DATA 234,177,243,141,135,2,174,134,2,165,206,73,128,32,28,234
2030 DATA 165,1,41,16,240,10,160,0,132,192,165,1,9,32,208,8
2040 DATA 165,192,208,6,165,1,41,31,133,1,32,86,192,173,13,220
2050 DATA 104,168,104,170,104,64,32,159,255,166,198,208,1,96,173,141
2060 DATA 2,141,167,2,189,118,2,201,136,208,15,198,198,173,169,2
2070 DATA 13,168,2,24,105,5,141,32,208,96,201,140,208,112,198,198
2080 DATA 169,147,32,210,255,169,36,133,251,169,251,133,187,169,0,133
2090 DATA 188,169,1,133,183,169,8,133,186,169,96,133,185,32,213,243
2100 DATA 165,186,32,180,255,165,185,32,150,255,169,0,133,144,160,3
2110 DATA 132,251,32,165,255,133,252,164,144,208,47,32,165,255,164,144

READY.

2120 DATA 208,40,164,251,136,208,233,166,252,32,205,189,169,32,32,210
2130 DATA 255,32,165,255,166,144,208,18,170,240,6,32,210,255,76,209
2140 DATA 192,169,13,32,210,255,160,2,208,198,32,66,246,96,201,139
2150 DATA 208,35,198,198,169,147,32,210,255,169,8,133,186,32,180
2160 DATA 255,169,111,133,185,32,150,255,32,165,255,32,210,255,201,13
2170 DATA 208,246,32,171,255,96,201,133,208,11,169,0,141,169,2,141
2180 DATA 168,2,76,107,192,201,134,208,8,169,1,141,169,2,76,107
2190 DATA 192,201,34,208,11,173,168,2,73,1,141,168,2,76,109,192
2200 DATA 201,13,208,11,169,0,141,168,2,76,109,192,234,234,234,168
2210 DATA 173,169,2,13,168,2,201,0,240,2,96,234,173,167,2,208
2220 DATA 1,96,152,24,105,229,176,8,173,167,2,201,4,240,1,96
2230 DATA 169,0,133,251,169,194,133,252,165,251,24,105,8,133,251
2240 DATA 144,2,230,252,136,208,242,177,251,208,1,96,198,198,160,0
2250 DATA 166,198,177,251,157,119,2,230,198,200,201,0,208,242,198,198
2260 DATA 96,120,169,192,141,21,3,169,0,141,20,3,141,167,2,141
2270 DATA 168,2,141,169,2,88,96,120,169,234,141,21,3,169,49,141
2280 DATA 20,3,88,96,-1
2290 :
2300 REM  ****************************
2310 REM      SETTING UP M/CODE DATA
2320 REM  ****************************
2330 :
2340 S=0:I=49152:PRINT"■ STORING M/CODE"
2350 READ B:IFB<>-1THENPOKEI,B:S=S+B:I=I+1:GOTO2350
2360 IFS<>59316THENPRINT"■ ERROR IN CODE DATA"
2370 IFI<>49602THENPRINT"■ ERROR IN NUMBER OF DATA ELEMENTS"
2380 IFS=59316ANDI=49602THENPRINT"■ TASK COMPLETED":SYS49567

READY.
```

Address Decml	Hex	Machine Code	Assembly Code Program	
49152	C000	20 EA FF	JSR	65514
49155	C003	A5 CC	LDAZ	204
49157	C005	D0 29	BNE	41
49159	C007	C6 CD	DECZ	205
49161	C009	D0 25	BNE	37
49163	C00B	A9 14	LDAIM	20
49165	C00D	85 CD	STAZ	205
49167	C00F	A4 D3	LDYZ	211
49169	C011	46 CF	LSRZ	207
49171	C013	AE 87 02	LDX	647
49174	C016	B1 D1	LDAIY	209
49176	C018	B0 11	BCS	17
49178	C01A	E6 CF	INCZ	207
49180	C01C	85 CE	STAZ	206
49182	C01E	20 24 EA	JSR	59940
49185	C021	B1 F3	LDAIY	243
49187	C023	8D 87 02	STA	647
49190	C026	AE 86 02	LDX	646
49193	C029	A5 CE	LDAZ	206
49195	C02B	49 80	EORIM	128
49197	C02D	20 1C EA	JSR	59932
49200	C030	A5 01	LDAZ	1
49202	C032	29 10	ANDIM	16
49204	C034	F0 0A	BEQ	10
49206	C036	A0 00	LDYIM	0
49208	C038	84 C0	STYZ	192
49210	C03A	A5 01	LDAZ	1
49212	C03C	09 20	ORAIM	32
49214	C03E	D0 08	BNE	8
49216	C040	A5 C0	LDAZ	192
49218	C042	D0 06	BNE	6
49220	C044	A5 01	LDAZ	1
49222	C046	29 1F	ANDIM	31
49224	C048	85 01	STAZ	1
49226	C04A	20 56 C0	JSR	49238
49229	C04D	AD 0D DC	LDA	56333
49232	C050	68	PLA	
49233	C051	A8	TAY	
49234	C052	68	PLA	
49235	C053	AA	TAX	
49236	C054	68	PLA	
49237	C055	40	RTI	
49238	C056	20 9F FF	JSR	65439
49241	C059	A6 C6	LDXZ	198
49243	C05B	D0 01	BNE	1
49245	C05D	60	RTS	
49246	C05E	AD 8D 02	LDA	653
49249	C061	8D A7 02	STA	679
49252	C064	BD 76 02	LDAX	630
49255	C067	C9 88	CMPIM	136
49257	C069	D0 0F	BNE	15
49259	C06B	C6 C6	DECZ	198
49261	C06D	AD A9 02	LDA	681
49264	C070	0D A8 02	ORA	680
49267	C073	18	CLC	
49268	C074	69 05	ADCIM	5
49270	C076	8D 20 D0	STA	53280
49273	C079	60	RTS	
49274	C07A	C9 8C	CMPIM	140
49276	C07C	D0 70	BNE	112
49278	C07E	C6 C6	DECZ	198
49280	C080	A9 93	LDAIM	147
49282	C082	20 D2 FF	JSR	65490
49285	C085	A9 24	LDAIM	36
49287	C087	85 FB	STAZ	251
49289	C089	A9 FB	LDAIM	251
49291	C08B	85 BB	STAZ	187
49293	C08D	A9 00	LDAIM	0
49295	C08F	85 BC	STAZ	188
49297	C091	A9 01	LDAIM	1
49299	C093	85 B7	STAZ	183
49301	C095	A9 08	LDAIM	8
49303	C097	85 BA	STAZ	186
49305	C099	A9 60	LDAIM	96
49307	C09B	85 B9	STAZ	185
49309	C09D	20 D5 F3	JSR	62421
49312	C0A0	A5 BA	LDAZ	186
49314	C0A2	20 B4 FF	JSR	65460
49317	C0A5	A5 B9	LDAZ	185
49319	C0A7	20 96 FF	JSR	65430
49322	C0AA	A9 00	LDAIM	0
49324	C0AC	85 90	STAZ	144
49326	C0AE	A0 03	LDYIM	3
49328	C0B0	84 FB	STYZ	251
49330	C0B2	20 A5 FF	JSR	65445
49333	C0B5	85 FC	STAZ	252
49335	C0B7	A4 90	LDYZ	144
49337	C0B9	D0 2F	BNE	47
49339	C0BB	20 A5 FF	JSR	65445
49342	C0BE	A4 90	LDYZ	144
49344	C0C0	D0 28	BNE	40
49346	C0C2	A4 FB	LDYZ	251
49348	C0C4	88	DEY	
49349	C0C5	D0 E9	BNE	233
49351	C0C7	A6 FC	LDXZ	252
49353	C0C9	20 CD BD	JSR	48589
49356	C0CC	A9 20	LDAIM	32

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Address Decml	Address Hex	Machine Code			Assembly Code Program	
49358	C0CE	20	D2	FF	JSR	65490
49361	C0D1	20	A5	FF	JSR	65445
49364	C0D4	A6	90		LDXZ	144
49366	C0D6	D0	12		BNE	18
49368	C0D8	AA			TAX	
49369	C0D9	F0	06		BEQ	6
49371	C0DB	20	D2	FF	JSR	65490
49374	C0DE	4C	D1	C0	JMP	49361
49377	C0E1	A9	0D		LDAIM	13
49379	C0E3	20	D2	FF	JSR	65490
49382	C0E6	A0	02		LDYIM	2
49384	C0E8	D0	C6		BNE	198
49386	C0EA	20	42	F6	JSR	63042
49389	C0ED	60			RTS	
49390	C0EE	C9	8B		CMPIM	139
49392	C0F0	D0	23		BNE	35
49394	C0F2	C6	C6		DECZ	198
49396	C0F4	A9	93		LDAIM	147
49398	C0F6	20	D2	FF	JSR	65490
49401	C0F9	A9	08		LDAIM	8
49403	C0FB	85	BA		STAZ	186
49405	C0FD	20	B4	FF	JSR	65460
49408	C100	A9	6F		LDAIM	111
49410	C102	85	B9		STAZ	185
49412	C104	20	96	FF	JSR	65430
49415	C107	20	A5	FF	JSR	65445
49418	C10A	20	D2	FF	JSR	65490
49421	C10D	C9	0D		CMPIM	13
49423	C10F	D0	F6		BNE	246
49425	C111	20	AB	FF	JSR	65451
49428	C114	60			RTS	
49429	C115	C9	85		CMPIM	133
49431	C117	D0	0B		BNE	11
49433	C119	A9	00		LDAIM	0
49435	C11B	8D	A9	02	STA	681
49438	C11E	8D	A8	02	STA	680
49441	C121	4C	6B	C0	JMP	49259
49444	C124	C9	86		CMPIM	134
49446	C126	D0	08		BNE	8
49448	C128	A9	01		LDAIM	1
49450	C12A	8D	A9	02	STA	681
49453	C12D	4C	6B	C0	JMP	49259
49456	C130	C9	22		CMPIM	34
49458	C132	D0	0B		BNE	11
49460	C134	AD	A8	02	LDA	680
49463	C137	49	01		EORIM	1
49465	C139	8D	A8	02	STA	680
49468	C13C	4C	6D	C0	JMP	49261
49471	C13F	C9	0D		CMPIM	13
49473	C141	D0	0B		BNE	11
49475	C143	A9	00		LDAIM	0
49477	C145	8D	A8	02	STA	680
49480	C148	4C	6D	C0	JMP	49261
49483	C14B	EA			NOP	
49484	C14C	EA			NOP	
49485	C14D	EA			NOP	
49486	C14E	A8			TAY	
49487	C14F	AD	A9	02	LDA	681
49490	C152	0D	A8	02	ORA	680
49493	C155	C9	00		CMPIM	0
49495	C157	F0	02		BEQ	2
49497	C159	60			RTS	
49498	C15A	EA			NOP	
49499	C15B	AD	A7	02	LDA	679
49502	C15E	D0	01		BNE	1
49504	C160	60			RTS	
49505	C161	98			TYA	
49506	C162	18			CLC	
49507	C163	69	E5		ADCIM	229
49509	C165	B0	08		BCS	8
49511	C167	AD	A7	02	LDA	679
49514	C16A	C9	04		CMPIM	4
49516	C16C	F0	01		BEQ	1
49518	C16E	60			RTS	
49519	C16F	A9	00		LDAIM	0
49521	C171	85	FB		STAZ	251
49523	C173	A9	C2		LDAIM	194
49525	C175	85	FC		STAZ	252
49527	C177	A5	FB		LDAZ	251
49529	C179	18			CLC	
49530	C17A	69	08		ADCIM	8
49532	C17C	85	FB		STAZ	251
49534	C17E	90	02		BCC	2
49536	C180	E6	FC		INCZ	252
49538	C182	88			DEY	
49539	C183	D0	F2		BNE	242
49541	C185	B1	FB		LDAIY	251
49543	C187	D0	01		BNE	1
49545	C189	60			RTS	
49546	C18A	C6	C6		DECZ	198
49548	C18C	A0	00		LDYIM	0
49550	C18E	A6	C6		LDXZ	198
49552	C190	B1	FB		LDAIY	251
49554	C192	9D	77	02	STAX	631
49557	C195	E6	C6		INCZ	198
49559	C197	C8			INY	
49560	C198	C9	00		CMPIM	0

Address Decml	Hex	Machine Code	Assembly Code Program	
49562	C19A	D0 F2	BNE	242
49564	C19C	C6 C6	DECZ	198
49566	C19E	60	RTS	
49567	C19F	78	SEI	
49568	C1A0	A9 C0	LDAIM	192
49570	C1A2	8D 15 03	STA	789
49573	C1A5	A9 00	LDAIM	0
49575	C1A7	8D 14 03	STA	788
49578	C1AA	8D A7 02	STA	679
49581	C1AD	8D A8 02	STA	680
49584	C1B0	8D A9 02	STA	681
49587	C1B3	58	CLI	
49588	C1B4	60	RTS	
49589	C1B5	78	SEI	
49590	C1B6	A9 EA	LDAIM	234
49592	C1B8	8D 15 03	STA	789
49595	C1BB	A9 31	LDAIM	49
49597	C1BD	8D 14 03	STA	788
49600	C1C0	58	CLI	
49601	C1C1	60	RTS	

KEYWORD SYSTEM by Peter Lager

ABS(= CBM<A>	AND = SHIFT<Q>	ASC(= SHIFT<A>
ATN(= CTRL<A>	CHR$(= SHIFT<C>	CLOSE = CTRL<C>
CLR = SHIFT<B>	CMD = CBM<B>	CONT = CTRL<B>
COS(= CBM<C>	DATA = SHIFT<D>	DEF FN = CBM<D>
DIM = CTRL<D>	END = CBM<E>	EXP(= SHIFT<E>
FN = CBM<F>	FOR = SHIFT<F>	FRE(0) = CTRL<F>
GET = CTRL<G>	GOSUB = CBM<G>	GOTO = SHIFT<G>
IF = CBM<U>	INPUT = SHIFT<I>	INT(= CBM<I>
LFFT$(= SHIFT<K>	LEN(= CBM<K>	LET = CBM<L>
LIST = SHIFT<L>	LOAD = CTRL<L>	LOG(= CTRL<K>
MID$(= SHIFT<M>	NEW = CTRL<N>	NEXT = SHIFT<N>
NOT = CBM<N>	ON = CBM<O>	OPEN = SHIFT<O>
OR = CTRL<O>	PEEK(= CTRL<P>	POKE = CBM<P>
POS(0) = CBM<M>	PRINT = SHIFT<P>	READ = SHIFT<H>
REM = CBM<J>	RESTORE = CBM<H>	RETURN = CBM<R>
RIGHT$(= SHIFT<R>	RND(= SHIFT<J>	RUN = CTRL<J>
SAVE = CTRL<W>	SGN(= SHIFT<Z>	SIN(= CBM<Z>
SPC(= SHIFT<X>	SQR(= CTRL<Z>	STEP = CTRL<X>
STOP = CBM<X>	STR$(= SHIFT<S>	SYS = CBM<S>
TAB(= CBM<T>	THEN = SHIFT<T>	TI = CBM<Y>
TI$ = CTRL<Y>	TO = SHIFT<Y>	USR(= SHIFT<U>
VAL(= SHIFT<V>	VERIFY = CTRL<V>	WAIT = SHIFT<W>

FUNCTION KEY	ACTION
F1	ENABLES KEYWORD MODE (GREEN BORDER)
F3	DISABLES KEYWORD MODE (BLUE BORDER)
F7	TESTS MODE
F6	PRINTS DISK ERROR MESSAGE
F8	PRINTS DISK DIRECTORY

NOTE. disk errors and directory do not overwrite any BASIC program in memory

SYS49589 WILL RETURN TO STANDARD CBM64 INTERRUPTS
SYS49567 WILL RE-ENABLE KEYWORD SYSTEM (EG. AFTER RUN STOP/RESTORE)

COMMODORE 64 AND 128 GRAPHICS SOFTWARE

CADPAK-64-new enhanced version. An advanced package for computer aided designs and drawings on the high resolution screen. There are now two versions on the disk, one working with a lightpen and the other controlled from the keyboard. The program is menu controlled and comes with a detailed 80+ page manual. CADPAK gives you two full high res screens, freehand draw, lines, boxes, circles, ellipses, arcs etc. You can fill an area with a pattern or a solid colour (pattern editor included). Copy any area of the screen to any other area or to the other screen. The accupoint feature allows placement of points or figures down to the pixel level, and the zoom feature allows detailed drawing within a small area of the screen. A unique feature is the ability to draw to an exact scale in metric or imperial units, and the hardcopy routine can be customised to produce a scaled drawing on a wide range of printers including the 1525, 1526, 801, 802, and Epson (serial or user port interface). Hardcopy can be produced in 2 sizes. Pictures may be saved to disk.
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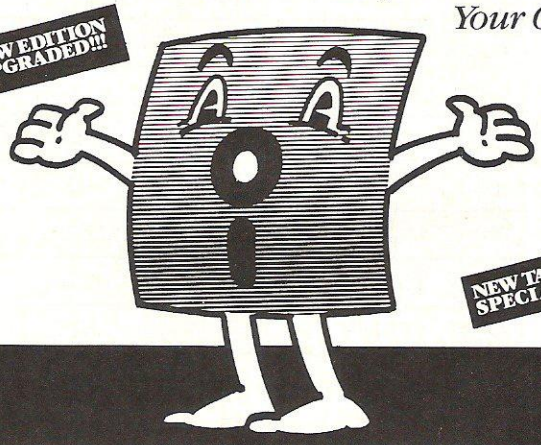

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Ian Bennett discloses some helpful programming tips for the 64 including both basic and assembly language routines.

Getting More from your 64

Redefined characters

One of the problems of using redefined characters is the need to copy the original character set into a position where you can get at it.

This program generates a routine starting at whatever line number you choose and then erases itself. This new routine can then be incorporated into any program which requires a redefined character set.

The program makes use of the keyboard buffer. It prints the line number and line contents onto the screen, then prints a second line below which contains the formula to work out the next line number etc. The program then puts two carriage returns into the keyboard buffer and ends the program using 'end'. Once ended the buffer then executes the two carriage returns which just happen to be over the information printed on the screen. The first line is entered as a new line and the second line which contains 'goto 5' then restarts the program. The same system is used to erase the original program.

Line 2: Changes the screen & border to black. Try using a different colour!

Lines 3-4: Asks for the start line number. An additional input could be used to change the step between line numbers.

Lines 5/9: Gets the value of z$ ready for printing it to the screen.

Line 6: Prints the line number followed by z$.

Line 7: Calculates the next line number and 'Q' to select the next line of information.

Line 8: Puts the carriage returns into the buffer. The 'poke 198,2' sets the number of characters in the buffer.

Lines 9-12: Contains the information for the new routine.

Line 22: Tests to see if all lines have been printed.

Line 24: Erases the original program.

The new routine copies the character set to 12288 = $3000. Line 10120 in the example shows a way of changing the cursor but should be deleted before run if not required.

```
1 REM *** IAN BENNETT 3RD MAY 1984 ***
2 POKE 53280,0:POKE 53281,0
3 INPUT"■FIRST LINE NO. ( 30 - 63000 )";A
4 PRINT:IF A< 30 OR A>63000 THEN 1
5 GOTO 9
6 PRINT"■■■■■■■■■■■■":PRINT A;" ";Z$
7 PRINT"■A=";A;"+10:Q=";Q+1;":GOTO 5"
8 POKE 198,2:POKE 631,13:POKE 632,13:PRINT "■■■■■■■":END
9 IF Q=0 THEN Z$="FORN=0TO33:READA:POKE49152+N,A:NEXT"
10 IF Q=1 THEN Z$="DATA169,0,133,251,133,253,169,48"
11 IF Q=2 THEN Z$="DATA133,252,169,208,133,254,160,0"
12 IF Q=3 THEN Z$="DATA177,253,145,251,200,208,249"
13 IF Q=4 THEN Z$="DATA230,252,230,254,165,252"
14 IF Q=5 THEN Z$="DATA201,64,208,239,96"
15 IF Q=6 THEN Z$="V=53248:POKE56334,PEEK(56334)AND254"
16 IF Q=7 THEN Z$="POKE1,PEEK(1)AND251:SYS49152"
17 IF Q=8 THEN Z$="POKE1,PEEK(1)OR4"
18 IF Q=9 THEN Z$="POKE56334,PEEK(56334)OR1"
19 IF Q=10 THEN Z$="POKEV+24,(PEEK(V+24)AND240)OR12"
20 IF Q=11 THEN Z$="REM USE BELOW TO CHANGE CURSOR"
21 IF Q=12 THEN Z$="FORX=13568TO13568+7:POKEX,38:NEXT"
22 IF Q<>13 THEN 6
23 A=2
24 PRINT"■■■■■"A"■A="A"+1:GOTO24":POKE198,2:POKE631,13:POKE632,13:PRINT"■":END
```

EXAMPLE BELOW

```
1 REM *** IAN BENNETT 3RD MAY 1984 ***
10000 FORN=0TO33:READA:POKE49152+N,A:NEXT
10010 DATA169,0,133,251,133,253,169,48
10020 DATA133,252,169,208,133,254,160,0
10030 DATA177,253,145,251,200,208,249
10040 DATA230,252,230,254,165,252
10050 DATA201,64,208,239,96
10060 V=53248:POKE56334,PEEK(56334)AND254
10070 POKE1,PEEK(1)AND251:SYS49152
10080 POKE1,PEEK(1)OR4
10090 POKE56334,PEEK(56334)OR1
10100 POKEV+24,(PEEK(V+24)AND240)OR12
10110 REM USE BELOW TO CHANGE CURSOR
10120 FORX=13568TO13568+7:POKEX,38:NEXT
```

Cursor-loc

This is a simple machine code routine which when called stores the cursor's current position to be called back at a later time.

The demonstration program is only to show how Cursor-loc works and has no great practical use. Run the program and then type some text. Press the "↑" key and "Enter text" will appear. Type in a little text and then press return. Now if you continue typing you will see that the text resumes at the point at which it left off. If you press "F1" the text you typed in earlier will then be displayed.

```
1 REM *** CURSOR-LOC BY IAN BENNETT 12/06.84 ***
10 FORX=0TO18:READA:POKE49152+X,A:NEXT
20 DATA 56,32,240,255,132,251,134,252,96
        234,164,251,166,252,24,32,240,255,96


C000 38       SEC        ;SET FLAG FOR READ
C001 20 F0 FF JSR $FFF0  ;READ CURSOR LOCATION
C004 84 FB    STY $FB    ;STORE COLUMN
C006 86 FC    STX $FC    ;STORE ROW
C008 60       RTS        ;RETURN TO BASIC
C009 EA       NOP        ;
C00A A4 FB    LDY $FB    ;GET COLUMN
C00C A6 FC    LDX $FC    ;GET ROW
C00E 18       CLC        ;SET FLAG FOR PLOT
C00F 20 F0 FF JSR $FFF0  ;PLOT CURSOR LOCATION
C012 60       RTS        ;RETURN TO BASIC
```

```
USE SYS 49152 TO STORE CURSOR LOCATION

USE SYS 49162 TO RETRIEVE CURSOR LOCATION
```

```
1 REM *** DEMONSTRATION PROGRAM ***
10 FORX=0TO18:READA:POKE49152+X,A:NEXT
20 DATA 56,32,240,255,132,251,134,252,96,234,164,251,166,252,24,32,240,255,96
30 PRINT"■■ COMMAND:■■"
40 GETA$:IFA$=""THEN40
50 IFA$=CHR$(94)THEN80
60 IFA$=CHR$(133)THENPRINTT$;
70 PRINTA$;:GOTO40
80 SYS49152
90 INPUT"■■ STATUS LINE : ENTER TEXT";T$
100 PRINT"■■ STATUS LINE                    "
110 SYS49162:GOTO40

READY.
```

View

View is designed to be incorporated in a basic program to enable you to list a basic program (prg) to screen direct from disk. It can be easily converted to list straight to printer.

The program also displays any messages hidden by chr$(20)s (deletes) these are displayed as "←".

Lines 63000-63040 Copies the basic vocabulary into array t$.

Line 63050 Asks for the filename of the program to be viewed.

Line 63070 Checks for any disk error.

Line 63080 Checks for type of character.

Line 63180 Prints character.

Line 63190-63200 Prints end address and closes file.

Line 63210 Subroutine to calculate two byte values.

```
63000 Y=0:DIMT$(75):FORX=41118TO41372
63010 IFPEEK(X)>128THENA$=A$+CHR$(PEEK(X)-128):GOTO63030
63020 A$=A$+CHR$(PEEK(X))
63030 IFPEEK(X)AND128THENT$(Y)=A$:A$="":Y=Y+1
63040 NEXT:M=2049
63050 INPUT"■■ENTER FILENAME";F$:PRINT"■"
63060 OPEN15,8,15:OPEN1,8,2,F$+",P,R"
63070 INPUT#15,A,B$,C,D:IFA<>0THENPRINT"■■"B$:GOTO63200
63080 GOSUB63210:PRINT"■ * START * ■"R
63090 GOSUB63210:N=R:IFL=0THEN63190
63100 GOSUB63210:PRINT:PRINT"■■"R;:M=M+4
63110 GET#1,A$:M=M+1:IFM=NTHEN63090
63120 IFST<>0THEN63200
63130 A=ASC(A$+CHR$(0)):IFA=34THENS=1-S
63140 IFA>203THENA=46
63150 IFA255THEN63180
63160 IFA=20THENA=ASC("←")
63170 IFA=>128ANDS=0THENPRINTT$(A-128);:GOTO63110
63180 PRINTCHR$(A);:GOTO63110
63190 PRINT:PRINT"■■ * END * ■"M
63200 CLOSE1:END
63210 GET#1,L$,H$:L=ASC(L$+CHR$(0)):H=ASC(H$+CHR$(0)):R=H*256+L:RETURN

READY.
```

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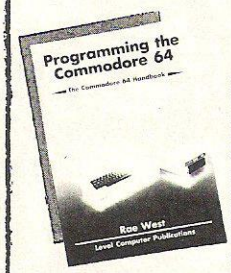

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A typical location on the C-64 would be 49152 or the cassette buffer.

```
1 REM *** IAN BENNETT 14/3/84 ***
2 REM  FOR THE VIC 20 & C 64
3 REM  UNIVERSAL LIST PAUSE PROGRAM
4 :
5 INPUT"ENTER PROGRAM LOCATION";L
10 X=PEEK(774)
20 Y=PEEK(775)
30 FORI=0+LTO7+L:READA:POKEI,A:NEXT
40 DATA72,173,141,2,208,251,104,76
50 POKE8+L,X
60 POKE9+L,Y
70 P1=INT(L/256)
80 P2=L-(P1*256)
90 POKE774,P2
100 POKE775,P1

READY.
```

CURSOR CHARACTERS

```
■ - By pressing the cursor down key
■ - By pressing the cursor down key with the shift key
■ - By pressing the cursor right key
■ - By pressing the cursor right key with the shift key
■ - By pressing the home key
■ - By pressing the home key with the shift key
■ - By pressing the control key and key 1
■ -                                key 2
■ -                                key 3
■ -                                key 4
■ -                                key 5
■ -                                key 6
■ -                                key 7
■ -                                key 8
■ - By pressing the CBM key with   key 1
■ -                                key 2
■ -                                key 3   ■ - By pressing key F1
■ -                                key 4   ■ - By pressing key F2
■ -                                key 5   ■ - By pressing Key F3
■ -                                key 6   ■ - By pressing key F4
■ -                                key 7   ■ - By pressing key F5
■ -                                key 8   ■ - By pressing key F6
■ - By pressing the control key and key 9   ■ - By pressing key F7
■ -                                key 0   ■ - By pressing key F8
```

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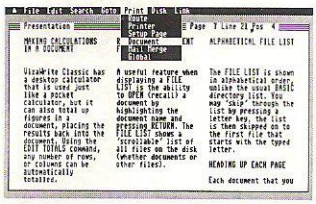

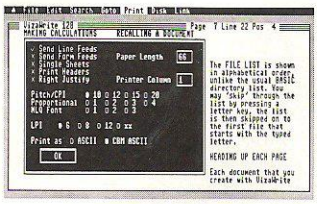

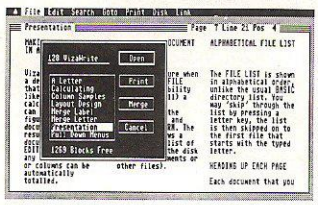

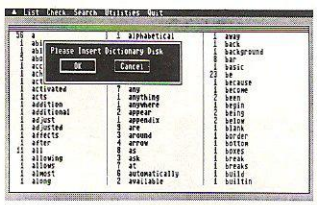

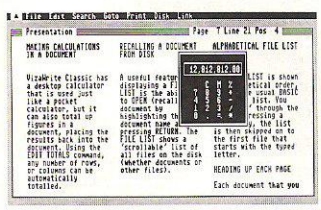

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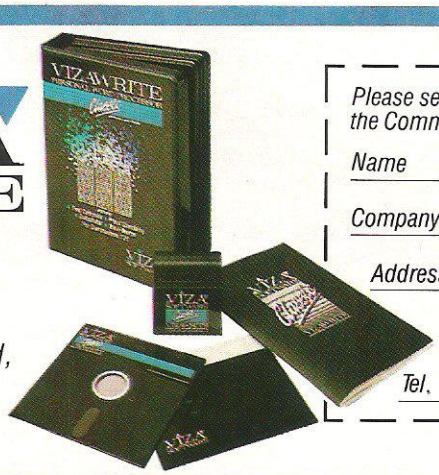

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128 Software Checklist

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	Music Maker 128	Music	19.99	d
Amplan Management Tel: 0845 597330	Sowplan	Pig breeding	600.00	d
	Cropplan F	Arable management	495.00	d
	New Ledger	Accounts	600.00	d
	Beeftek	Beef production management	375.00	d
	Hamplan	Pig breeding	375.00	d
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	Paintbox Graphics	Graphics	9.95	c
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Galasoft Tel: 0268 682719	Day Book	Small Business	TBA	d
Hisoft Tel: 0582 696421	Devpak 80	Assembler	39.95	d
	Pascal 80	Compiler	39.95	d
	C++	C Compiler	39.95	d
Impex Tel: 01-900 0999	Company Pack 123	Accounting Suite	98.95	d
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Vizasoftware Tel: 0634 45002	Vizawrite Classic	Wordprocessor	99.95	d
	Vizastar 128	Database/Spreadsheet/ Graphics	129.95	d

Hard Disk Drive for C128

News reached us shortly before going to press, of the first hardware add-on for the C128 to be independently produced in addition to Commodore's package (128, 1570 disk drive and 1901 monitor).

Precision Software now has a hard disk version of SuperBase and SuperScript on the ST10C 10 megabyte hard disk drive, which is in fact compatible with all Commodore computers.

It features IEEE and serial interfaces, supports networking and includes a back-up facility. (Look out for review in next month's issue.)

The price of the ST10C on its own is £12.75. The ST10C including SuperBase and SuperScript costs £14.00. The units are available only direct from Precision.

Precision will shortly be releasing the same package for SuperBase 64. (Incidentally, Precision assure us that SuperBase 64 is compatible with the Plus/4 which should greatly please Plus/4 owners.

Contact: Precision Software, No. 6 Park Terrace, Worcester Park, Surrey T4 7JZ. Tel: 01-330 7166.

ATTENTION ALL PROGRAMMERS!!

If you have come across any useful hints and tips, why not share your knowledge with other CCI readers?

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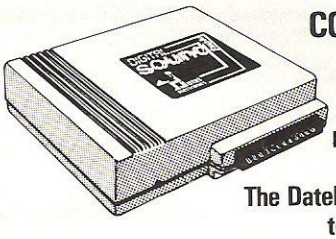

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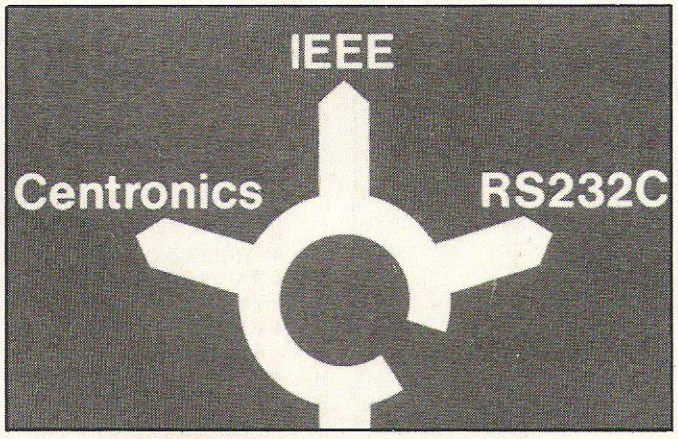
Printing in a Parallel Universe

Tony Lydeard poses the questions you should ask when considering buying an interface and reviews two of the latest interfaces. Both are compatible with the 64, 128, C16 and Plus/4.



However you arrived at the decision to buy your computer, you're going to have the same sort of agonising to do when you decide it's time to buy a printer. What is it you want to print? BASIC program listings, screen dumps, letters, invoices, spreadsheet printouts, articles for computer magazines? Do you need your printouts to look as if they were done on a typewriter? Would you like several different typestyles available? Are you going to need foreign characters such as accents, umlauts and funny Os? What sort of paper are you going to use – continuous, roll or single sheet; normal or thermal? Are you going to want hi-res graphics? And finally – how much money have you got?

Like nearly everything in this life (with the possible exception of magazine publishing) you tend to get more or less what you pay for. The better the printer, the more it costs. A nationwide network of distributors and servicing agents (printers can and do go wrong from time to time) costs a bit to maintain and must be reflected in the purchase price.

Standard interface

So you've chosen your printer. You've saved up your Saturday pennies and you've bought it. The room is full of bits of expanded polystyrene and you're ready to go. I do hope that this is not the moment you discover that Commodore, in their infinite wisdom, have chosen not to provide a standard interface on their home computers. By "standard interface" I am of course referring to the method which most printer manufacturers have adopted for exchanging information with computers. There are two standards – RS232 (serial) and Centronics (parallel). The latter appears to have received the wider acceptance and is the one most usually found both on printers and computers.

To be fair, there are at least a couple of manufacturers who have conceded to CBM and who now offer a "Commodore interface" as an option on their equipment, which can thus be plugged straight into the back of a C64 (or C128, C16, Plus/4 or VIC) just like Commodore's own range of printers. The drawback to this solution is that the printer will not work with any other micro. Should you decide (for whatever reason) to change your computer system, you'll have to change your printer – at added cost.

A particular advantage of opting for the Centronics interface is that you will be able to take your C64 to the office and use the expensive printer they've got there.

Although Commodore themselves do not, to my knowledge, supply a Centronics-type adapter, there are a lot of independent manufacturers who offer devices which will give you access to the bewildering array of printers and plotters which are on the market. These range from simple connectors costing as little as £15 to intelligent devices with their own microprocessors which will set you back over £100. A lot of serious programs have built-in Centronics software so a connector may be all you need. The more expensive gadgets offer features more or less in proportion to their price. The most important feature is

An Epson in Commodore clothing!

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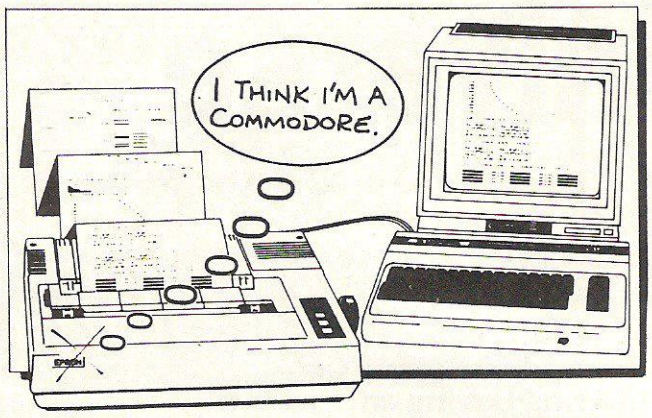
How many Commodore home computer owners, when faced with buying a printer, have longed to own an Epson but been put off by the problems involved? Firstly, it's not easy to connect the two together. Secondly, even when connected, it may be necessary to load driver software or the cartridge slot may be unusable. Finally Commodore-specific characteristics such as graphics and formatting commands will not be available.

Now Micro Control Systems have the solution. Just plug the Comprint circuit board inside the Epson, connect the cable supplied to the Serial I/O port on the Commodore computer and Hey Presto! The Comprint fools the Commodore into thinking it is working with a Commodore printer. All the features are there – total emulation. And it even provides a 2K buffer as well.

What's more all the additional features that have made Epson so successful, such as condenced print and other type styles, are accessible directly by the Commodore computer. For the business user the ability to use 15 inch paper (in the MX/RX/Fx-100 range) and print a £ sign (or other Epson special characters) will prove invaluable.

So go on – spoil yourself. If you are the owner of a Commodore personal computer treat yourself to an Epson – and a Comprint of course!



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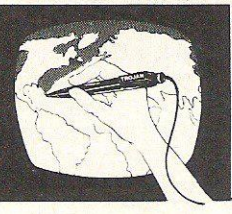

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usually the ability to connect the printer via the C64's serial port and thus make the computer think it's communicating with a Commodore printer. This enables you to print from cheaper programs without the necessity of loading separate software for the interface.

It's a couple of these more expensive devices that I've been having a look at:

THE CONNECTION

This offering from the American Tymac Controls Corporation comprises a little black box (well, blue actually) with three bits of wire coming out of it. One, 40cm long, is a ribbon cable with a connector which plugs into the printer. The second, a generous 1.8m, connects to the serial port of computer or disk drive and the third, of similar length, is a single strand which fetches power from the cassette port in much the same way as that supplied with the 92008/G. The Connection has a push button marked "Reset" and two little lights marked "Ready" and "Busy".

The interface is factory-configured for particular groups of printers. According to the manual of the Epson version, there are four other variations which produce full emulation (ie including graphic symbols) and a "Universal" model for daisy-wheel printers and other dot-matrix types.

There are only two switches to worry about – accessed through a hole in the top of the box. With switch 1 open, the interface is in Emulation mode and acts like a Commodore 1525 printer. Switch 2 toggles between Limited and Extended modes. The latter incorporates commands additional to those available on the 1525 and the Limited mode is only included in case of difficulties which may be encountered when using commercial software written for the 1525.

Printing modes

Closing switch 1 puts The Connection into Transparent Mode, whereby codes are transmitted direct to the printer. This is most useful in conjunction with programs which can translate Commodore ASCII into real ASCII and therefore output control codes to the printer as well as intelligible text. Switch 2 now decides whether or not an automatic linefeed is transmitted.

The third mode in which the interface can work is Total Text. Commodore block graphics are translated into two or three letter mnemonics such as <UP>, <DWN>, <CLR> and so on. This, of course, is great for program listings. Where a symbol does not represent a command, it is printed as its decimal ASCII number.

There are four versions of Emulate and Total Text modes with minor variations, such as linefeed and cursor up/down. Any mode can be selected by means of a secondary address on the OPEN command. The switch for Transparent mode is provided to allow for programs which do not cater for alterations to secondary addresses.

The Connection has a self-test routine which allows the user to test the printer/interface combination. At £85 for the Epson version or £80 for the Universal model, I'd have expected a typeset manual rather than the dot-matrix printout on poor quality paper that is provided. The writing of the manual is OK with a clear explanation of all the features and short BASIC routines to type in. A very nice gadget to have if you can afford it – one you won't miss too much if you've better things to do with the cash.

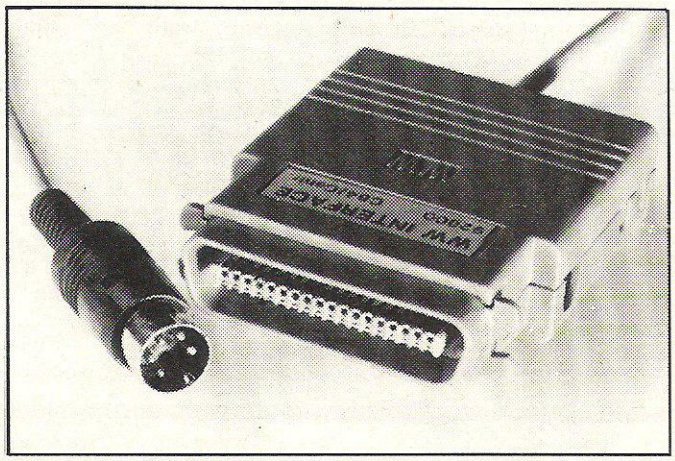
Contact: Tymac, Unit 78, Standard Way, Gravelly Industrial Park, Birmingham B24 8TL.

92008/G

This rather unimaginatively-named gadget is of German origin and is distributed in the UK by FCC Systems Ltd. At one end of a 1.5 metre cable is a 5-pin DIN plug that fits into the serial socket on your computer or disk drive. At the other is a standard Centronics connector which will plug straight into the printer. Incorporated into the latter is a cartridge which contains the clever bits. The cartridge has to be prised open (an easy enough job) to get at a bank of PCB mounted switches which are used to configure the interface for a variety of printers.

Fifty-six different printers are mentioned in the documentation, with the corresponding switch positions. Of these, 45 can be used to the full extent of the interface's capabilities and the remaining 11 (and most others that the manual writer couldn't think of at the time) can print all ASCII characters and carry out normal printer functions but won't print CBM block graphics or perform screen dumps. Five of the eight switches are used for printer configuration. Of the remaining three, one is unused, one activates the automatic linefeed on printers with this feature and the last is used to set the device number to either 4 or 5.

The interface requires a 5-volt supply, which some printers provide. For use with those that are not so obliging, there is a separate 1.5m lead that takes power from the cassette port (the actual connector is double sided so that the cassette unit can be connected simultaneously) to a jack socket on the interface cartridge.



Printer modes

In use, the 92008/G has five different modes which are selected by the use of secondary addresses in the OPEN statement used to initialise the printer. Two of these are the Commodore "cursor-up" and "cursor-down" modes. The former prints capitals and CBM block graphics, the latter prints upper and lower case. Toggling between the two is equivalent to using the <SHIFT><CBM> combination to alter the screen display. In either mode the printer will behave exactly like a Commodore machine and will accept Commodore control codes to dictate the appearance of the printed text. These include the use of double-width, reversed or condensed characters, defining the position of characters or the use of graphics. It is also possible to call "cursor-up" mode from "cursor-down" and vice versa. In these two "copy-cat" modes it is not possible to use the printer's own special features – if you end up using these modes only, you might just as well have bought a Commodore printer in the first place and saved the £64.99 that the 92008/G costs.

Of the three remaining modes, one is used to lock into the previously set mode (this can also be done by the use of control codes from within other modes) while the other two are "transparent" modes. This means that character codes are received by the printer exactly as they left the computer, enabling the printer's own special features to be accessed. CBM codes and block graphics cannot be used.

The device is neat in appearance and the manual is clear and uncomplicated. In use it was trouble-free once the correct switches had been set. Overall, I found it a useful gadget. My only reservation is the price – this may be because I don't personally have a need to print CBM block graphics or control codes and my cheap connector/software combination can do everything else that the 92008/G can.

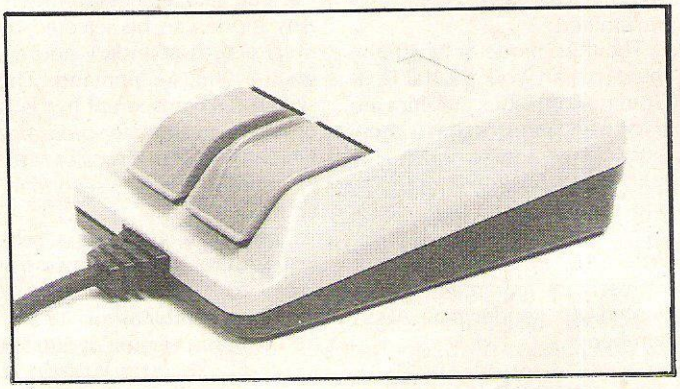
Contact: FCC Systems Ltd, The Lodge, Moorlands Road, Merriott, Somerset. Tel: 0460 73442.

Megamouse comes to the 64

Wigmore House, known for it's BBC Megamouse, has launched the MS 2000 mouse for the 64/128.

Costing £69.00 (inc VAT), the mouse comes complete with a graphics software package.

An optical encoding technique inside the mouse is used for measuring movements to a resolution of 100 points to the inch. A rubber coated ball enables quiet and accurate use on smooth surfaces without slipping.



The cassette-based software of the mouse claims to offer more than any other Commodore mouse. Avoiding the Macpaint layout, the MS 2000 offers the following features:

- line drawing functions which include freehand drawing in both dotted and continuous lines, straight lines and rubber band lines with a choice of pencil thickness;
- circles, ellipses and boxes - filled or outline (mistakes can be rectified with an 'undo' command);
- colours for both objects and background which can be changed from a wide palette;
- outline shapes can be filled in with a plain colour or a range of 32 colours;
- ability to paint and airbrush in various thicknesses and also to paint and spray in the 32 patterns;
- zoom facility allowing details to be checked and pixel changes;
- pan screen upwards or sideways, and copy designs to different areas on the screen or rotate;
- mirror image utility.

Creations can be saved to and loaded from cassette and can be printed out on a Commodore MPS-802 or MPS-803 monochrome printer.

Contact: Wigmore House, 32 Saville Row, London W1X 1AG. Tel: 01-734 0171.

64 Eprom Programmer

Cambridge Microelectronics has released a dedicated Eprom programmer for the 64. Called Prom-64, it plugs into the expansion port while a metal bracket at its rear acts as a stand and a handle.

It costs £39.95 (inc VAT, p&p) and driver software is supplied on tape. Prom-64 will handle the 2764 (8K) and 27128 (16K) Eproms and their newer 'A' types.

Features included are: Decimal or HEX operation; operate on part or whole of Eprom; driver with menus, on-screen status and sound; errors and task completion reported on-screen; high voltage generator on-board; high quality zero insertion force Eprom socket.

The Prom-64 CHECKs the Eprom is clean; READs the contents of Eprom into RAM; BLOWs Eprom from data in RAM; VERIFYs contents of Eprom against data in RAM; CRCs of data in Eprom or RAM.

Contact: Cambridge Microelectronics, 1 Milton Road, Cambridge CB4 1UY. Tel: 0223 314814

Improve Output

Eight different typefaces are available from Font Factory, including one that provides descenders on the Commodore 1525/801 printer.

Font Factory is one of three new programs for the 64 from Impex. At a price of £19.95 (inc VAT), Font Factory can read any standard Commodore ASCII file, format it and print the document. It also gives you full control over line width, line spacing, headers, footers, etc.

Included on the disk is Signwriter 64. This program enables you to generate large letters up to 40 characters long and from two inches to one foot high!

Fantastic Filer is the modest name given to a menu-driven file management system. Features include free form layout; 50 files per record and fast three second search. It costs £12.95.

Screen Dumper 64 is the third new program from Impex. At £12.95, it transfers to your printer a copy of what you see on your monitor including hi-res graphics, text, and multi-colour sprites.

The program is loaded into a hidden location enabling the 64 to be used normally. Colours are represented by 16 shades of grey for faithful reproduction.

Contact: Impex Software, Metro House, Second Way, Wembley, Middx HA9 0TY. Tel: 01-900 0999.

Triple Standard Modem

Three commonly used communications speeds are incorporated in one compact box with Tandata's Tm 602 triple standard modem.

At £465 (exc VAT), the modem is designed to meet the data communication needs of a wide range of users. It combines V22 (1200/1200bps full duplex), V21 (300/300bps) and V23 (1200/75, 75/1200 and 1200/1200bps half duplex).

The Tm 602 is BABT approved and its features include asynchronous operatin; autodial; autoanswer; control of the modem through a command string that can include telephone number, baud rate, ID of log-on string; front panel re-set switch; five status LEDs; RS232C interface; a socket for a telephone handset and self-test diagnostics.

The modem can be used with virtually any computer at either the user or host end, in both attended and unattended operation, and with virtually any telephone, PSS network or PABX.

Contact: Tandata Marketing, Albert Road North, Malvern, Worcs WR14 2TL. Tel: 06845 68421.

Take 64!

If you have ever secretly desired to shoot your own film or make a TV programme, get the clapper boards out and take a look at Screenplay from Macmillan.

Screenplay is a book and software package costing £8.95. The book explains, at a fairly basic level, the story of authentic TV and film production techniques and some of the tricks of the trade such as double exposures and wipes. The accompanying cassette enables you to create your own movie characters, invent dialogue, design scenery, add sound effects, compose a soundtrack and put the whole thing together.

Contact: Macmillan Software, 4 Little Essex Street, London WC2R 3LF. Tel: 01-836 6633.

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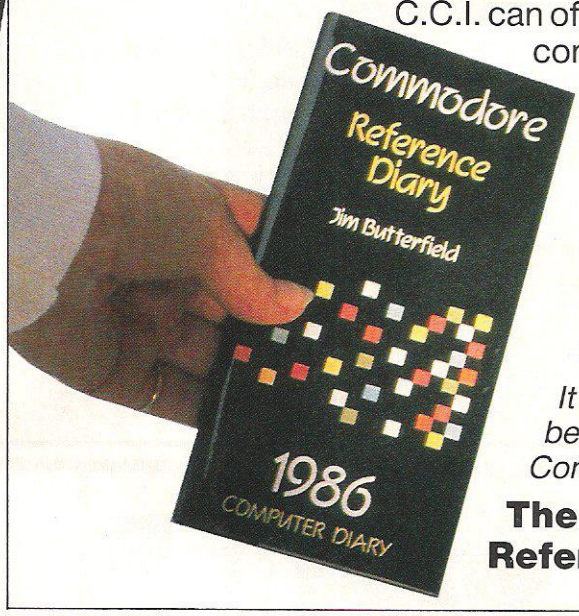

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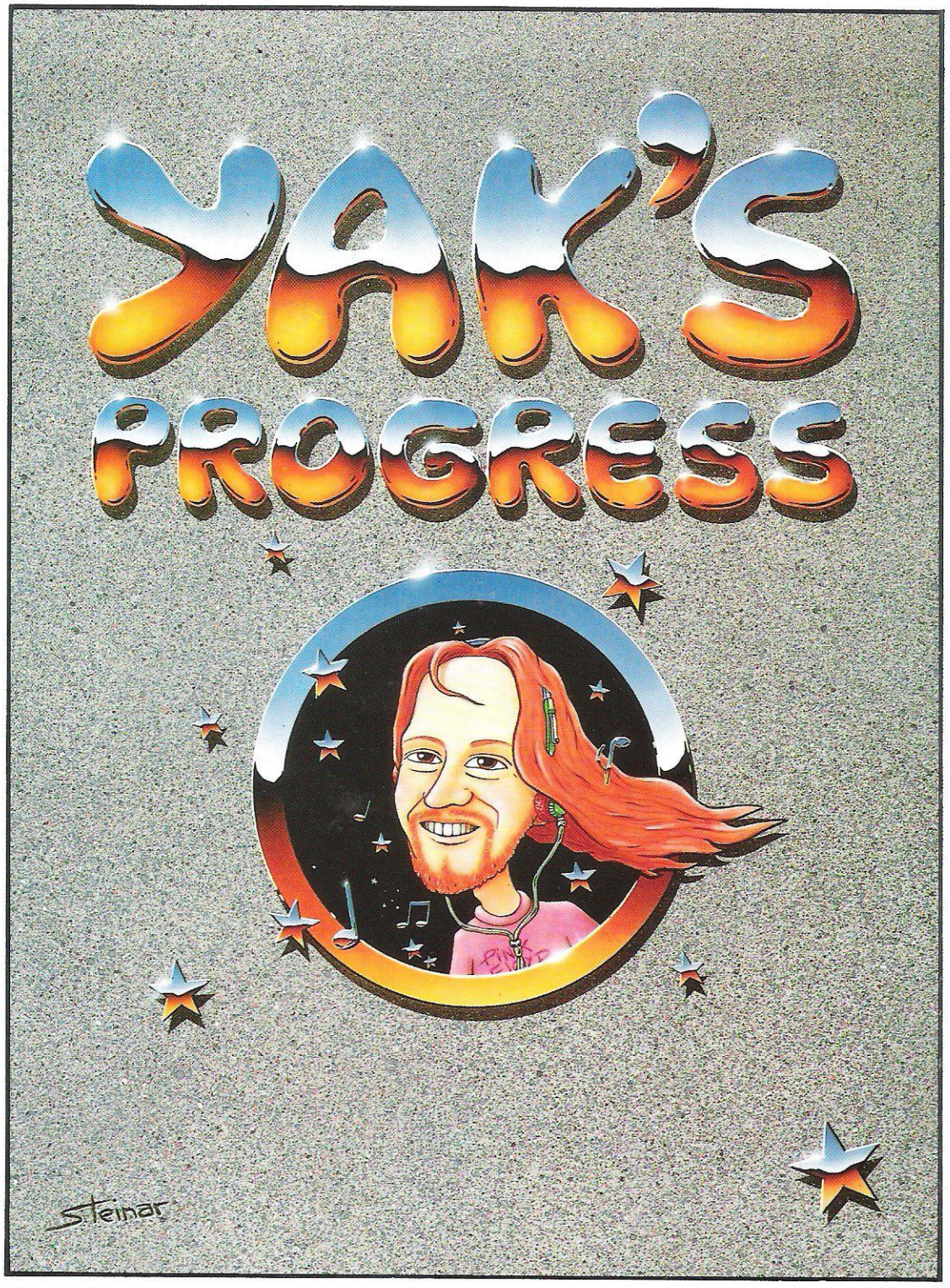

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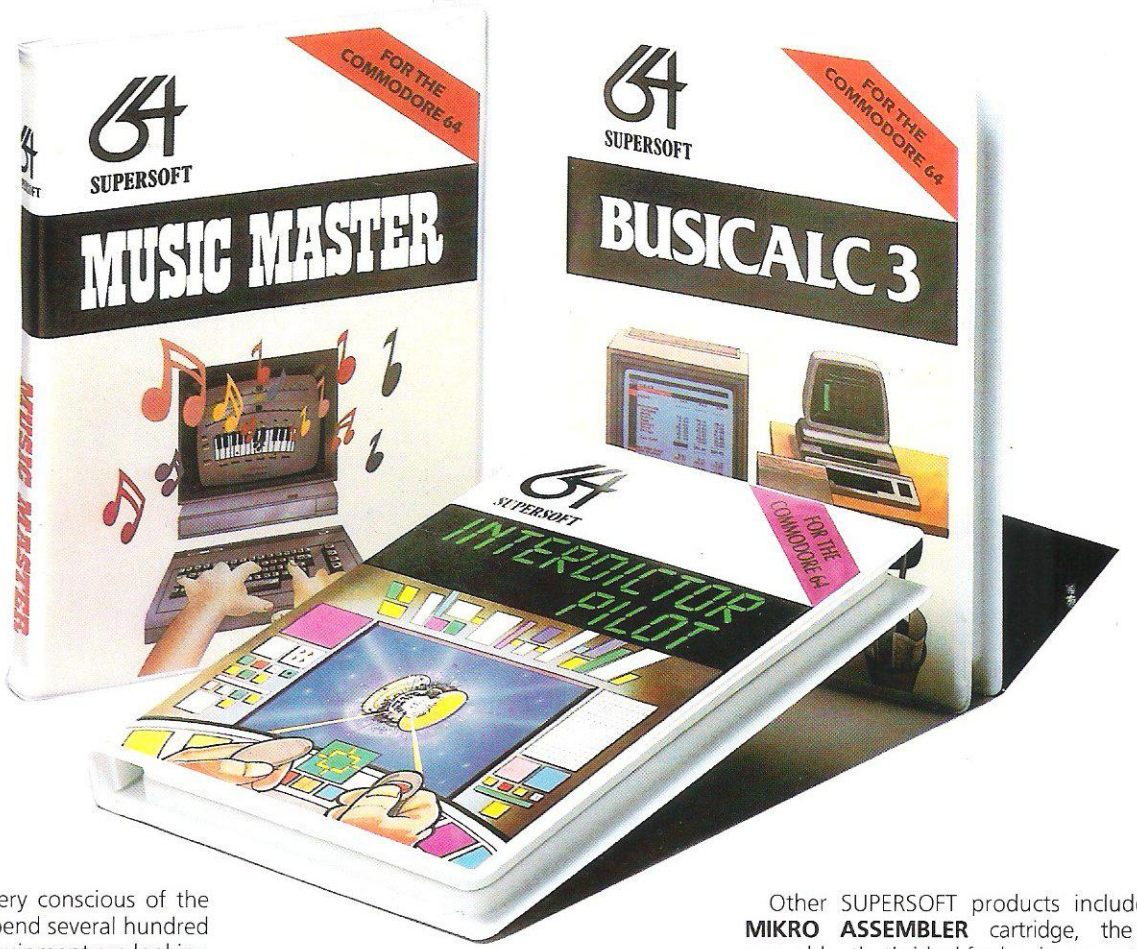
Choosing the right computer is a good start — but can you find the right software?



At SUPERSOFT we're very conscious of the fact that people who spend several hundred pounds on computer equipment are looking to do rather more than play Space Invaders.

Financial planning is a rather grand name for something you've been doing all your life – making ends meet! Perhaps if Mr Micawber had used **BUSICALC** he would have been able to balance the books a little better.

For home, club or small business use BUSICALC 1 should pay for itself in no time at all; for larger companies we recommend BUSICALC 3, one of the few really valuable programs that you can learn to use in a day.

Although your Commodore 64 is a powerful musical instrument you need to be a pretty good programmer to understand how it all works. Unless, of course, you buy **MUSIC MASTER!**

To use MUSIC MASTER requires no prior musical knowledge, though in the hands of an experienced musician it will prove an invaluable tool. You don't need to know the first thing about programming either! MUSIC MASTER is the musical equivalent of a word processor, remembering the notes you play and allowing you to replay and edit them as you wish.

INTERDICTOR PILOT is a space flight simulator. Nowadays simulators are widely used to train pilots and astronauts because – to be frank – it's a lot cheaper (and safer) than the real thing!

Imagine, if you will, life in the 22nd century: space travel is commonplace, and on the outskirts of the galaxy the first war between civilizations is being fought. A shortage of trained pilots has prompted the Federation to develop a computer simulation that allows raw recruits to gain experience without paying for their mistakes with their lives. With the aid of your Commodore 64 you too can learn to pilot the Interdictor Mk 3 craft. But be warned – this is no game!

Other SUPERSOFT products include the **MIKRO ASSEMBLER** cartridge, the only assembler that's ideal for beginners yet powerful enough for the professional (most of our competitors use it!). The **VICTREE** cartridge adds dozens of commands to Basic including toolkit aids and disk commands; or on disk there's **MASTER 64,** a really comprehensive package for the keen programmer.

Of course, we do also publish games programs, and with classics like **STIX, QUINX** and **KAMI-KAZE** in our range we are one of the market leaders. But we most enjoy coming up with the sort of programs that are going to be in use for months and years, not hours and days – the sort of programs that make you glad that you bought a computer – and glad that you bought SUPERSOFT!

You won't find SUPERSOFT products on the shelves of your local supermarket. But most specialist shops stock titles from our extensive range (and are prepared to obtain other programs to order). However you can also buy direct by sending a cheque (pre-paid orders are post free!), by calling at our offices, or over the telephone using your ACCESS card.

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